HITACHI

SERVICE MANUAL

TK | No. 3651E

VT-M161A,AW

Technical Data

SPECIFICATIONS

Recording:	Rotary two head Helical Scan Azimuth Recording
Video:	NTSC Color EIA Standard
Cassette:	VHS Type
Heads:	2 video heads 1 Full track audio/video erase head 1 Combination head for control track, audio erase and audio record/play (3 heads/single housing)
Tape Speed:	33.35 mm/sec (SP), 16.67 mm/sec (LP) (playback only), 11.12 mm/sec (EP)
Tape Width:	12.7 mm
RF Output:	Channel 3 or Channel 4
RF Input:	UHF/VHF 75 ohm
Tuning Range:	VHF LOW CH, 2 ~ 6 (54 MHz – 88 MHz) VHF MID CH, A-5 ~ A-1 and A ~ I (90 MHz – 174 MHz) CATV VHF HIGH CH, 7 ~ 13 (174 MHz – 216 MHz) VHF SUPER CH, J ~ W (216 MHz – 300 MHz) CATV VHF HYPER CH, W_{+1} ~ W_{+28} (300 MHz – 468 MHz) CATV UHF CH, 14 ~ 69, W_{+29} ~ W_{+84} (470 MHz – 806 MHz)
Video Input:	1 – 2 Vp-p 75 ohm Unbalanced
Video Output:	1 Vp-p 75 ohm Unbalanced
Audio Input:	316 mV rms (–7.8 dB) 100 kohm
Audio Output:	316 mV rms (–7.8 dB) 600 ohm
Video Recording S/N:	Better than 46 dB (SP), Better than 40 dB (EP)
Horizontal Resolution:	240 lines (SP), 230 lines (EP)
Audio Response:	50 Hz – 10 kHz (SP), 100 Hz – 6 kHz (EP)
Audio S/N:	Better than 43 dB (SP), Better than 40 dB (EP)
Power Input:	AC 120V 60 Hz
Power Consumption:	23W Nominal
Cabinet Size:	14-9/16"(W) x 3-1/2"(H) x 12-5/8"(D) 37.0(W) x 8.9(H) x 32.0(D) cm
Weight:	11.7 lbs (5.3 kg)
Accessories:	1 – Coaxial cable 1 – Remote control unit 2 – Batteries

Design and Specifications subject to change without notice.

VHS

This video deck is a VHS type video recorder. For proper operation, only the VHS type cassette must be used.

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

VIDEO CASSETTE RECORDER

April 1992 Video Systems Operation

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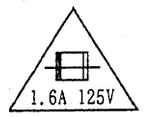
CAUTION AGAINST FUSE REPLACEMENT MARKING /
MESURE DE PRÉCAUTION À PRENDRE À PROPOS DES MARQUES DE FUSIBLE / :

CAUTION : FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH SAME TYPE AND SAME RATING FUSE IN ACCORDANCE WITH THE FUSE SYMBOL MARKING.
MESURE DE PRÉCAUTION : POUR ASSURER À L'APPAREIL UNE PROTECTION PERMANENTE CONTRE TOUT RISQUE D'AMORÇAGE ÉLECTRIQUE, REMPLACER UNIQUEMENT PAR UN FUSIBLE DE MÊME TYPE ET DE MÊME CATÉGORIE CONFORMÉMENT AUX MARQUES INDIQUÉES SUR LE FUSIBLE.

* Example / * Exemple



This symbol indicates Fast Operating Type 1.6A, 125V Fuse.
Ce symbole se rapporte à un fusible à fusion rapide de type 1,6A, 125V

CHAPTER 1

SAFETY PRECAUTIONS

NOTICE: Comply with all cautions and safety related notes located on or inside the cabinet and on the chassis.

1. When replacing a chassis in the instrument, all the protective devices must be put back in place, such as barriers, non-metallic knobs, adjustment and compartment covers/shields, isolation resistors/capacitors, etc.
2. When service is required, observe the original lead-dress. Extra precautions should be taken to assure correct lead dress in the high voltage circuit.
3. Always use the manufacturer's replacement components. Especially critical components as indicated on the circuit diagram should not be replaced by other manufacturer's. Furthermore, where a short-circuit has occurred, replace those components that indicate evidence of overheating.
4. Before returning an instrument to the customer, the service technician must thoroughly test the unit to be certain that it is completely safe to operate without danger of electrical shock, and be sure that no protective device built into the instrument by the manufacturer has become defective or inadvertently defeated during servicing.

Therefore, the following checks should be performed for the continued protection of the customer and service technician.

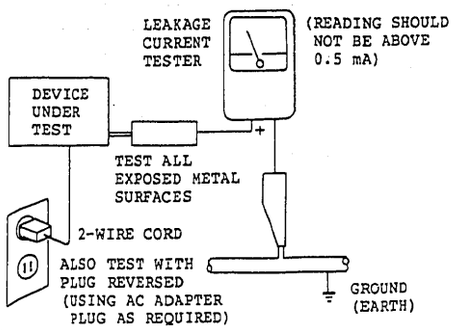
Leakage Current Cold Check

With the AC plug removed from the AC120V, 60Hz source, place a jumper across the two plug prongs. Turn the AC power switch on. Using an insulation tester (DC500V), connect one lead to the jumpered AC plug and touch the other lead to exposed metal parts (antennas, screwheads, metal overlays, control shafts, etc.), particularly any exposed metal part having a return path to the chassis. Exposed metal parts having a return path to the chassis should have a minimum resistor reading of 0.3 Mohm and a maximum resistor reading of 5 Mohm. Any resistor value below or above this range indicates an abnormality which requires corrective action. Exposed metal parts not having a return path to the chassis will indicate an open circuit.

Leakage Current Hot Check

Plug the AC line cord directly into a AC120V, 60 Hz outlet (do not use an isolation transformer for this check).

Turn the AC power switch on. Using a "Leakage Current Tester", measure for current from all exposed metal parts of the cabinet (antennas, screwheads, metal overlays, control shaft, etc.), particularly an exposed metal part having a return path to the chassis, to a known ground (earth) (water pipe, conduit, etc.). Any current measured must not exceed 0.5 mA.


LEAKAGE CURRENT TESTER
(READING SHOULD NOT BE ABOVE 0.5 mA)
DEVICE UNDER TEST
TEST ALL EXPOSED METAL SURFACES
2-WIRE CORD
ALSO TEST WITH PLUG REVERSED (USING AC ADAPTER PLUG AS REQUIRED)
GROUND (EARTH)

AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE UNIT TO THE CUSTOMER.

PRODUCT SAFETY NOTICE

Many electrical and mechanical parts have special safety-related characteristics. These are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.
Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.
The use of a substitute replacement component which does not have the same safety characteristics as the HITACHI recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.
Product safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current HITACHI Service Manual. A subscription to, or additional copies of, HITACHI Service Manual may be obtained at a nominal charge from HITACHI SALES CORPORATION.

FOR CANADA

CAUTION AGAINST FUSE REPLACEMENT

FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH SAME TYPE AND SAME RATING FUSE IN ACCORDANCE WITH THE FUSE SYMBOL LABEL.

The following is the indication of the fuse symbol label which is affixed adjacent to the fuse in the equipment.

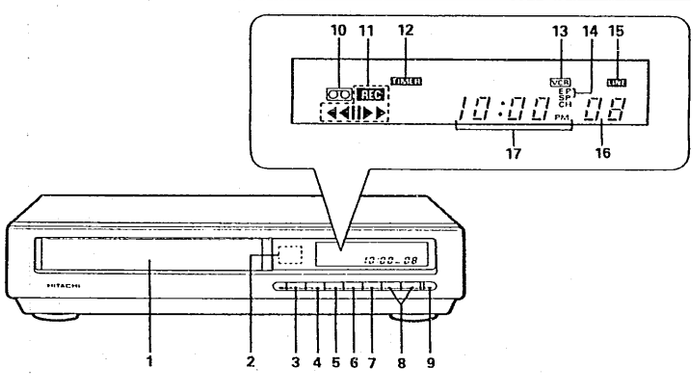
* Example

This symbol indicates Fast Operating Type 2A, 250V Fuse.

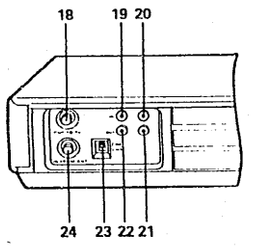
COMPARISON WITH PREVIOS MODEL

	ITEM	VT-M161A/M161AW	VT-M150A/M151A
FEATURES	REC/PLAY SYSTEM	VHS	VHS
	HQ(HIGH QUALITY)	USED	USED
	COMB FILTER	USED	USED
	NUMBER OF CHANNELS	181 CH	181 CH
	CHANNEL PRESET	F.S AUTO TUNING	F.S AUTO TUNING
	CHANNEL SELECT	UP/DOWN,10 KEYS	UP/DOWN,10 KEYS
	CATV/NOR. SELECT	YES (OSD)	YES (OSD)
	TIMER REC PROGRAM	8 PROGRAMS/1 YEAR	8 PROGRAMS/1 YEAR
	TIMER BACK-UP	ABOUT 5 SECONDS	ABOUT 5 SECONDS
	MODE DISPLAY	OSD/FL DISPLAY	OSD/FL DISPLAY
	TIMER PROGRAMMING	OSD (BY REMOTE CONTROL)	OSD (BY REMOTE CONTROL)
	CHANNEL TUNING	OSD (BY REMOTE CONTROL)	OSD (BY REMOTE CONTROL)
	CLOCK SETTING	OSD (BY REMOTE CONTROL)	OSD (BY REMOTE CONTROL)
	TV SELECT BUTTON	YES (BY REMOTE CONTROL)	YES (BY REMOTE CONTROL)
	IRT START BUTTON	NO	NO
	IRT LENGTH BUTTON	YES	YES
	COUNTER DISPLAY	OSD/FL DISPLAY	OSD/FL DISPLAY
	SCANAPLAY INDEX	YES	YES (VT-M151A/M151AW)
	COUNTER GO-TO	YES	YES (VT-M151A/M151AW)
	MOVIE RETURN	YES	NO
	AUTO TRACKING	NO	NO
	LINE/TUNER SELECTOR	YES	YES
	PICTURE CONTROL	NO	NO
	INTELASCAN GUIDE	YES	YES
CHASSIS	BASIC CHASSIS TYPE	PZ (QUICK MECHANISM)	PZ (QUICK MECHANISM)
	HALF LOADING MECHANISM	PROVIDED	PROVIDED
	HEADS ON SYLINDER	2 HEADS SP,LP,EP:30μm	2 HEADS SP,LP,EP:30μm
	HEAD CLEANING MECHANISM	PROVIDED	PROVIDED
MAIN CONTROL ICs	VIDEO CIRCUIT		
	LUMINANCE/CHROMA PROCESS	HA118158NT (IC201) HA118157NT (IC201)	HA118158NT (IC201) HA118157NT -M151AW ONLY-(IC201)
	CCD 1H DELAY	CXL5507P (IC202)	CXL5507P (IC202)
	AUDIO CIRCUIT		
	AUDIO AMP	LA7297 (IC401)	LA7297 (IC401)
	SERVO CIRCUIT		
	PHASE/SPEED CONT.	HD49747NT (IC601)	HD49747NT (IC601)
	FG AMP	BA6993 (IC602)	BA6993 (IC602)
	CYLINDER MOTOR DRIVE	BA6459P1 (IC1651)	BA6459P1 (IC1651)
	TIMER/SYSTEM CONTROL CIRCUIT		
	MAIN μP	CXP50120-135Q (IC751)	CXP50120-112Q (IC751)
	LOADING MOTOR DRIVE	BA6209U4 (IC753)	BA6209U4 (IC753)
	RESET	PST529I (IC755)	PST529I (IC755)
	OSD CIRCUIT		
	CG μP	μPD6450C-703 (IC1401)	μPD6450C-703 (IC1401)
	POWER SUPPLY		
	5.6V REGULATOR	M5F7805 (IC864)	M5F7805 (IC864)

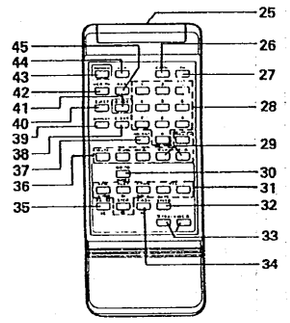
CONTROLS AND FEATURES



1. **CASSETTE COMPARTMENT**
   Insert a cassette in through a door, and loading will be completed automatically.
   Note: Power is turned on automatically when the cassette is loaded.
2. **INFRARED RAY RECEIVING SECTION**
   Receives the infrared ray from remote control unit.
3. **POWER BUTTON**
   Turn system power on and off.
4. **STOP/EJECT BUTTON**
   If this button is pressed, while the set is operating, the running of tape stops and all operating modes are cancelled (except for timer recording). The cassette is ejected, when this button is pressed again in STOP mode.
   Note: Power may be on or off when removing the cassette.
5. **REWIND/VISUAL SEARCH BUTTON**
   Press to start rewind.
   Press this button during playback, and reverse playback picture at high speed can be seen.
6. **PLAY BUTTON**
   Press to start play.
   Note: When the cassette (with erase prevention tab removed) is loaded, playback starts automatically.
7. **FAST FORWARD/VISUAL SEARCH BUTTON**
   Press to activate fast forward.
   Press this button during playback, and forward playback picture at high speed can be seen.
8. **CHANNEL SELECT BUTTONS**
   Select the channels you wish to view or to record by pressing these buttons.
   And you can also select "LINE"* by pressing these buttons to record or watch the program input at the VIDEO IN and AUDIO IN.
   (*One channel position either higher or lower outside the range of your preset channels.)
9. **RECORD/IRT BUTTON**
   Press to start recording.
10. **TAPE-IN INDICATOR**
    Lights when cassette is loaded in the compartment.
11. **VCR MODE INDICATOR**
    - REC appears during recording.
    - ◁◁ appears during the rewind mode.
    - ▷▷ appears during the fast-forward mode.
    - ▷ appears during the playback.
    - ▯▯ appears when the PAUSE button is pressed during record or play mode and disappears when the PAUSE button is pressed again.
12. **TIMER INDICATOR**
    Will light when turning power off after programming.
13. **VCR INDICATOR**
    Appears when the VCR is turned on or the VCR is in the playback mode.
14. **TAPE SPEED INDICATORS**
15. **LINE INDICATOR**
    Lights when you select the LINE position by pressing the AVX button or CHANNEL select button. LINE position is used to record or watch the program input at the VIDEO IN and AUDIO IN.
16. **CHANNEL INDICATOR**
17. **CLOCK DISPLAY**
    Shows the clock and tape counter.



18. **ANTENNA OUTPUT**
    Connect this terminal to the antenna terminal on the back of the TV.
19. **VIDEO IN**
    Receives video signal from a video camera or another VCR.
20. **AUDIO IN**
    Receive audio signals from a stereo system or another VCR.
21. **AUDIO OUT**
    For a connection to a monitor or another VCR.
22. **VIDEO OUT**
    For connection to monitor TV.
23. **RF CONVERTER SWITCH**
    Set this switch to whichever channel (CH3 or CH4) is unused in your area.
24. **ANTENNA INPUT**
    Connect the UHF and/or VHF antenna to this terminal.
25. **SIGNAL TRANSMISSION WINDOW**
    Transmits an invisible light beam (infrared) from the remote control unit to the VCR.
26. **CATV BUTTON**
    First press this button when operating your Cable Converter with this remote control, and then press the button which corresponds to the function you want.
27. **TV BUTTON**
    First press this button when operating your TV with this remote control, and then press the button which corresponds to the function you want.
28. **NUMBER BUTTONS "0" THROUGH "9"**
    Select any channel (whether or not it is in the "Tuner Scan List") by pressing two buttons. (Press "0" and then "8" for channel 8.) The number buttons are also used for setting the clock and programming the timer.
29. **CHANNEL SELECT BUTTONS**
    Same as the buttons on the VCR.
30. **GO-TO/INDEX BUTTON**
    Press this button to search for the scene you want to view using the counter GO-TO or INDEX feature.
31. **VCR CONTROL BUTTONS**
    These buttons (except for "REC" buttons) function same as the buttons on your VCR.
    Note: The REC buttons must be pressed simultaneously to start recording.

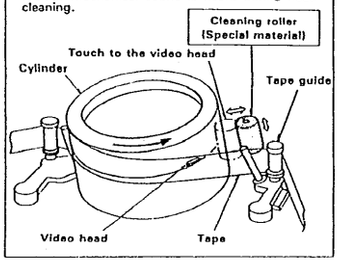


32. **TAPE SPEED SELECT BUTTON**
    Recording time using Cassette tape T-160:
    EP: 8 hours SP: 2.6 hours
    Notes:
    - Playback speed automatically corresponds with recorded speed.
    - This VCR cannot record in LP mode, but can play LP recorded tapes.
33. **TRACKING CONTROL BUTTONS**
    To minimize noise in playback. May also be used during visual search to move the noise bars up or down on the screen.
34. **FRAME ADVANCE BUTTON**
    Press to view tape one frame at a time.
    Operates only after PAUSE button has been pressed.
35. **PAUSE BUTTON**
    Press to pause during recording or playback.
36. **TV CONTROL BUTTONS**
    Used for controlling the TV.
    You need not press the TV button before pressing these buttons.
37. **100/ENT BUTTON**
    Used to select TV or CATV channels.
    Press "100", "2", "3" in this order to select channel 123.
    Press "100", "0" and "5" for channel 105.
38. **CLEAR BUTTON**
    Used for programming the timer.
    And also used for counter reset button.
39. **DISPLAY BUTTON**
    1st Press .... Calls up the mode display on TV screen.
    2nd Press .... Defeats the display function. Useful to prevent recording the On-Screen-Display. Also changes the VCR's display from the clock to the tape counter.
    3rd Press .... Does not change the display on the TV screen at all. Changes the VCR's display from the counter to the clock.
    Note: When the counter is displayed in the VCR display, the mode display does not appear on the TV screen even if the DISPLAY button is pressed.

40. **EJECT BUTTON**
    When this button is pressed in modes other than recording, the tape stops, and the cassette is ejected.
41. **INTELASCAN GUIDE BUTTON**
    Press this button to use the Intelascan feature.
42. **VCR/TV SELECT BUTTON**
    Selects the signal to be viewed.
    The VCR indicator comes on when the unit is in VCR mode and the signal received by the VCR is displayed on the TV screen. With the switch in the TV position (indicator light off) the broadcast signal is received directly by your TV set. When the VCR power is turned off, the VCR automatically switches to "TV".
43. **POWER BUTTON**
    Press to turn VCR on. Press again to turn VCR off.
44. **VCR BUTTON**
    First press this button when operating the VCR with this remote control and then press the button which corresponds to the function you want.
45. **AVX BUTTON**
    Press to select tuner position to record or view an off-the-air TV program (through the VCR's built-in tuner) or the "LINE" position to record or view the program input through the video and audio fine input jacks.

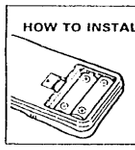
Auto Head Cleaning System

This system cleans the video heads automatically when a cassette is inserted and ejected or the power is turned on or off while a cassette is in the VCR, to prevent dirt from accumulating on the heads.
NOTE: Mechanical sound is heard during head cleaning.



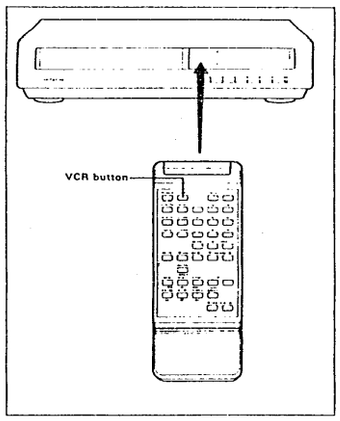
■ USING THE REMOTE CONTROL UNIT

HOW TO INSTALL BATTERIES



NOTES:
1. Be sure to install two "AA" size batteries before use.
2. Be aware of the polarity.

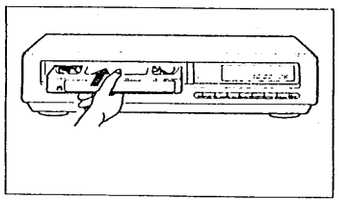
Aim the remote control at the receiver on the front panel of the VCR.



NOTES:
1. If the range is short, try new batteries.
2. An object in between the VCR and remote control unit may block the invisible light beam and operation will not be possible.
3. If you cannot operate the VCR with this remote control, first press the VCR button and then press the button which corresponds to the VCR function you want.

TIMER RECORDING

The programmable electronic clock/timer permits the unattended recording of up to 8 preselected programs, including one program on the same day of each week or one program at the same time every day.
It can be preset up to 1 year in advance to record your favorite programs. It turns the unit on and off and changes channels automatically.



1. Insert the Cassette.
2. Press the SPEED button to select "SP" or "EP".
3. Set the program timer.
   "START (ON) TIME", "STOP (OFF) TIME", "DAY" etc. See below.
4. Turn power off. Now recording will begin automatically at the start time.

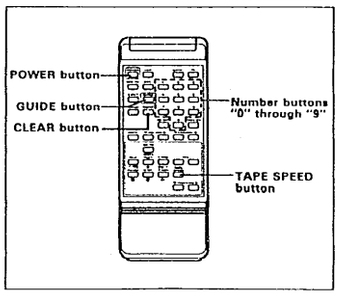
Notes:
- It is not necessary to press RECORD button.
- The TIMER indicator flashes to warn that recording will not occur because cassette has not been inserted. If the safety tab on the cassette has been removed, the VCR will automatically eject the cassette when placed in the Timer mode.

■ Programming the timer for unattended recording
For unattended recording the timer needs to know what day to make the recording, the time to start, the time to stop, and the channel to be recorded.

Things to know before starting

- While you are programming the timer, the "menu" display on the TV screen will prompt you through the procedures.
- You can correct an error in the program any time before the last step by pressing CLEAR button repeatedly until the digit to be corrected becomes flashing and then enter the correct digit.
- The programming will automatically resume the "original menu" if no further steps are followed in programming for about 1 minute.
- The "original menu" will be switched to the TV screen automatically if it is left on without further steps for about 1 minute.

1. Turn on the power of both VCR and TV.
2. Be sure that the TV is set to the video channel (channel 3 or 4).
3. Aim the remote control unit at the receiver on the front panel of the VCR.



TIMER RECORDING (cont)

4. Press the GUIDE button on the remote control unit until the "menu", as illustrated, appears on the TV.

5. Press button "3" to set the program.

for recording up to 8 programs on a single day or over the days within a period of 1 year.

for recording up to 8 programs at the same time(s) Monday through Friday within a period of 1 year.

for recording up to 8 programs on certain days of every week within a period of 1 year.

Note: Any one of these program modes or any combination thereof (up to 8 programs in total) may be selected. A typical example of a "Normal" program is demonstrated below.

6. Press button "1". The display will prompt you to select the channel to be recorded.

7. Press two digits for the channel to be recorded (for example, "0" "4" for channel 4). The display will prompt you to enter the recording start time.

Notes:
- If you want to select channel 124 for example, press "100", "2", "4" in this order.
- Press the AVX button when recording a picture from external equipment. "LINE" will appear in the display.

In this case, "NORMAL/CATV SELECTION" on page 18 should be selected "CATV1" or "CATV2".

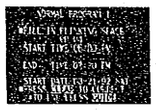
8. Press four digits, two for the hour and two more for a minute (for example, "0" "6" "0" "0" for 6:00). The display will prompt you to select either AM or PM.

Note: Always press "0" before a single digit hour and minute.

9. Press "1" for AM or "2" for PM. The display will prompt you to select the stopping time.

10. Press four digits, two for the hour and two more for the minute (for example, "0" "7" "3" "0" for 7:30). The display will prompt you to select the date.

11. Press four digits (two for the month and two for the day) (for example, "0" "3" "2" "1" for begin recording on March 21). The year and day of the week are displayed automatically.



12. Press the GUIDE button to enter your program and return to the programming "menu" display. Additional programs may be entered by repeating Steps 6 through 11.
If you have no other programs to enter, press the GUIDE button twice.
The display returns to the TV screen.

13. Turn off VCR power.
Now recording will begin automatically at the start time.

Note: To stop a timer recording in progress with the VCR, press POWER button and then press STOP button within 10 seconds.

RECALLING THE PROGRAM

1. Follow Steps 1 through 5 of "Programming the timer for unattended recording" on page 25.
The programming "menu" appears on the TV screen.

2. Press "4" button (Program Review).
The TV screen will display for 10 seconds the information you entered for the lowest program number. Then the display changes to the next higher program number and so on, until all program information has been displayed.
3. Press "4" again if you want to view the next program information immediately.
4. When you finish reviewing the programs, press the GUIDE button three times to switch off the on-screen display.

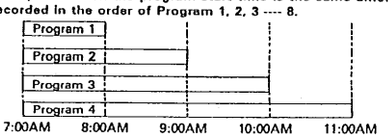
CLEARING ("ERASING") INFORMATION FROM A PROGRAM

1. Follow Steps 1 through 5 of "Programming the timer for unattended recording" on page 25.
The programming "menu" appears on the TV screen.
2. Press "4" button (Program Review).
The TV screen will display for 10 seconds the information you entered for the lowest program number. Then the display changes to the next higher program number and so on, until all program information has been displayed.
3. Press "4" again if you want to view the next program information immediately.
4. Press CLEAR button when the program information you want to clear is displayed.
5. Press the GUIDE button three times to switch off the on-screen display.

Note:
- Normal program is cleared automatically when the timer recording is finished, but daily and weekly programs remain in the timer even after the timer recording is finished.

PROGRAM PRIORITY

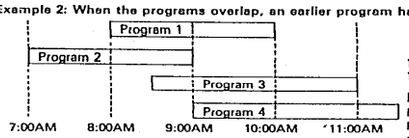
Example 1: When the program start time is the same among the programs on the same day, they are recorded in the order of Program 1, 2, 3 ---- 8.



7:00AM — 8:00AM for Program 1
8:00AM — 9:00AM for Program 2
9:00AM — 10:00AM for Program 3
10:00AM — 11:00AM for Program 4

Program 1 is executed as programmed, and Program 2 as illustrated after Program 1, and Program 3 as illustrated after Programs 1 and 2, and Program 4 as illustrated after Programs 1, 2 and 3.

Example 2: When the programs overlap, an earlier program has priority.



7:00AM — 9:00AM for Program 2
9:00AM — 10:00AM for Program 1
10:00AM — 11:00AM for Program 3
11:00AM — for Program 4

Program 2 is executed as programmed, and Program 1 as illustrated after Program 2, and Program 3 as illustrated after Programs 2 and 1, and Program 4 as illustrated after Programs 2, 1 and 3.

HOW TO OPERATE YOUR TV OR CABLE CONVERTER BY USING THE REMOTE CONTROL UNIT

This remote control unit is designed to operate 13 different types of TV's and 6 different types of cable converters. You must first program the remote control unit to match the remote system in your TV or cable converter.

Programming the remote control for TV set

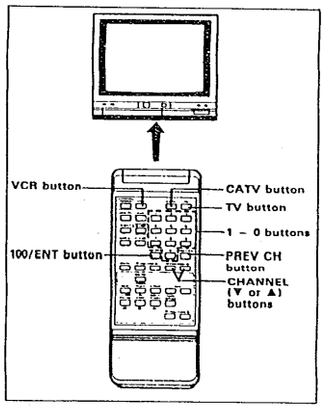
1. Install the batteries in the remote control unit.
2. Turn on your TV.
3. Point remote control unit toward front of your TV.
4. While holding TV button down, press 1 through 0, CHANNEL (▲), (▼), 100/ENT and PREV CH button (one at a time). The TV will change channels when the matching number button is pressed.
5. Release both buttons when the TV starts changing channels. The other remote buttons shown on next page will now control your TV.

Programming the Remote Control for Cable Converter

1. Install the batteries in the remote control unit.
2. Turn on your Cable Converter.
3. Point remote control unit toward front of your Cable Converter.
4. While holding CATV button down, press 1 through 7 button (one at a time). The Cable Converter will change channels when the matching number button is pressed.
5. Release both buttons when the Cable Converter starts changing channels. The other remote buttons shown on next page will now control your Cable Converter.

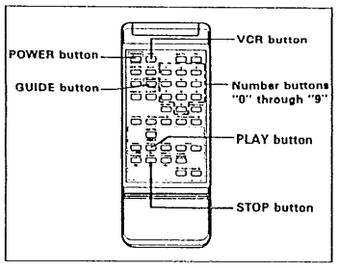
Notes:
- If your TV or Cable Converter does not respond to any of the above procedures, the TV or Cable Converter cannot be controlled by this remote control unit.
- You will only have to program your remote control to match your TV or Cable Converter once. It will remember what codes matchs your TV or Cable Converter until you replace the batteries.
- Whenever you install or replace batteries in the remote control, you must program the remote control to match the remote system in your TV or Cable Converter.
- When operating the TV or Cable Converter, first press the TV or CATV button, and then press the button which corresponds to the TV or Cable Converter function you want.

- When you want to operate the VCR with this remote control after operating the TV or Cable Converter, first press the VCR or GUIDE button and then press the button which corresponds to the VCR function you want.



CHANNEL TUNING

The automatic programming feature makes it easy and convenient to program the TV station into the tuner's memory.
Automatic programming is usually a "one-time" procedure, but you will need to repeat it if you move to a location that has different channels, or if the power is interrupted for about 5 seconds.



1. Turn on the power of both VCR and TV.
2. Be sure that the TV is set to the video channel (channel 3 or 4). (See page 15.)
3. Aim the remote control unit at the receiver on the front panel of the VCR.

4. Press the GUIDE button on the remote control unit until the "MENU", as illustrated, appears on the TV screen.
   NOTE: If the menu does not appear when the GUIDE button is pressed, press the VCR button and then the GUIDE button.

Original menu

5. Press button "1" for channel setting. The channel setting "MENU" appears on the TV screen.

6. Press button "1" to select "NORMAL", "CATV1" or "CATV2". If your VCR is connected to a home antenna system, select "NORMAL"; select "CATV1" when your VCR is connected to a cable antenna. Switching is performed between "NORMAL", "CATV1" and "CATV2" on the TV screen every time button "1" is pressed.
   NOTE: Usually select "CATV1" when your VCR is connected to a cable antenna. "CATV2" is to be selected in special cases. See page 19 for details.

7. Press "2" button.
   The tuner will automatically cycle through all available channels in the area and place them in the tuner's memory. It takes about 2 — 3 minutes.
   The channel number will stop changing when the tuner is finished cycling. Programming is now completed.
   You can select the active channels by pressing the CHANNEL select buttons.

■ Eliminating unwanted preset channels

You may want to have only a few favorite channels in the tuner's memory so you can select them more quickly with the CHANNEL select button.
Occasionally automatic programming may include a vacant channel in the tuner's memory if there happened to be some sort of "noise" or "stray signal" on the channel when the tuner was programmed. This procedure explains how to delete any unwanted channels from the tuner's memory.

1. Follow steps 1 through 5 of "Channel Tuning" on page 18.
   The channel tuning "menu" appears on the TV screen.

2. Press "3". The "menu", as illustrated, will appear on the TV screen.

3. Select the channel number by pressing buttons "0" through "9". (Press "0" and then "8" for channel 8.) Press the PLAY button to add channels and the STOP button to erase channels.
   Perform the same procedure to add or erase other channel numbers.
   NOTE: Erased channels cannot be selected by the CHANNEL button, but can be selected by buttons "0" through "9".
4. Press GUIDE button to return to the TV screen.

NOTE: There are some areas where channels cannot be switched when "CATV1" is selected. In this case, select "CATV2" as in step 6 on the previous page.

■ Adding channels to the tuner's memory

You may have deleted a channel from the tuner's memory and want to put it back. Occasionally automatic programming may "miss" an active channel because the signal is very weak or because the channel happened to be "off the air" when the tuner was programmed. Use this procedure to add any channel in the memory.

Your VCR is capable of receiving "off-the-air" TV channels (VHF 02 — 13, UHF 14 — 69) and CATV channels 01 — 125, a total of 181 channels*.

* You can receive channels 02 — 13 on both "off-the-air" and "cable" channels. Therefore, the total number of channels including "off-the-air" and "cable" channels is 181 channels (12 + 56 + 125 − 12 = 181).

DISASSEMBLY

1. NAMES AND LOCATIONS OF CIRCUIT BOARDS

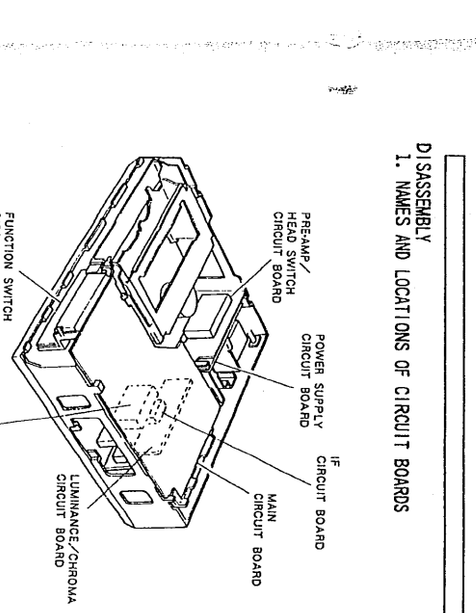


Fig. 1-1 Top View

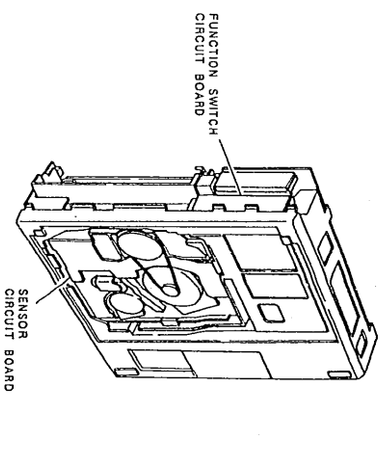


Fig. 1-2 Bottom View

(Procedure when removing)
Remove the components in the order of letters (A, B, C ···) in the illustrations.
(Procedure when reinstalling)
Reinstall the components by the reverse procedure to removal when not otherwise specified.

2. CASE REMOVAL

1. Top Cover

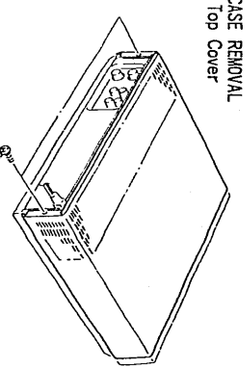


Fig. 2-1

2. Bottom Cover

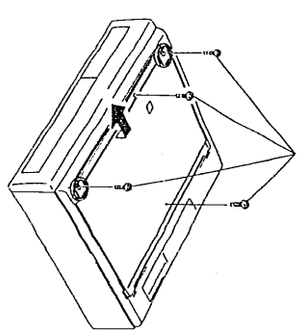


Fig. 2-2

3. Front Panel
   * Components to remove first
     1) Top Cover (Item 2-1)
     2) Bottom Cover (Item 2-2)
   (Caution when reinstalling)
   · Reinstall the front panel while the cassette door is pushed in halfway, so that the boss of door actuating arm can be positively engaged with the recess on the side of the door as shown below.

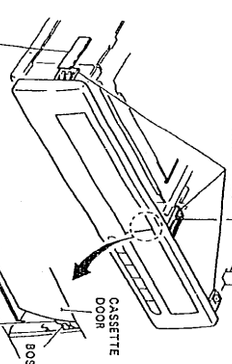


Fig. 2-3

4. Cassette Door
   * Components to remove first
     1) Front Panel (Item 2-3)
   (Caution when reinstalling)
   ·Attach the spring at the right of the cassette door firmly.

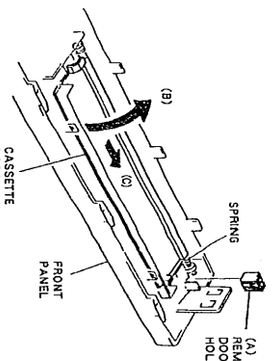


Fig. 2-4

5. Rear Panel

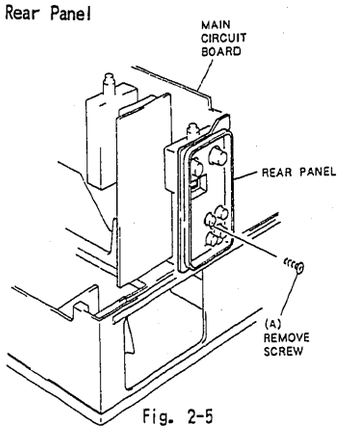


Fig. 2-5

Be sure to remove the cases when servicing and checking the circuit boards.
- Top Cover (see item 2-1)
- Bottom Cover (see item 2-2)
- Front Panel (see item 2-3)

3. CIRCUIT BOARD REMOVAL

1. Function SW Circuit Board

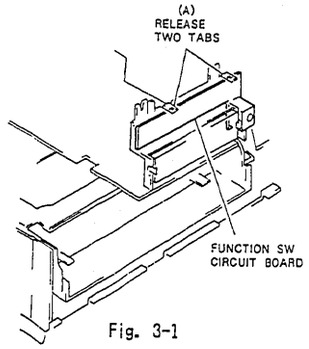


Fig. 3-1

2. Main Circuit Board

[Caution]
- After removing the main circuit board, set it to the servicing position shown on page 3-1.

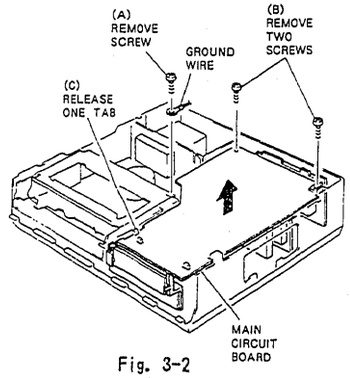


Fig. 3-2

3. Luminance/Chroma Circuit Board

(Before removing)
1) Remove the main circuit board.
(See item 3-2)

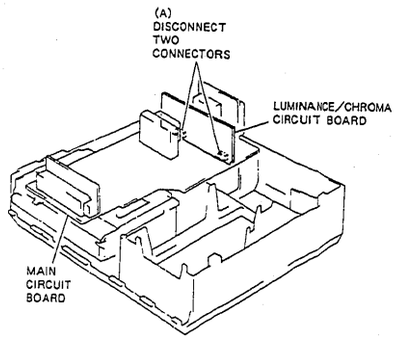


Fig. 3-3

4. Power Supply Circuit Board
5. Pre/Rec Amp Circuit Board

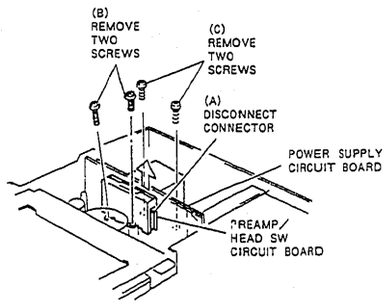


Fig. 3-4

6. Sensor Circuit Board

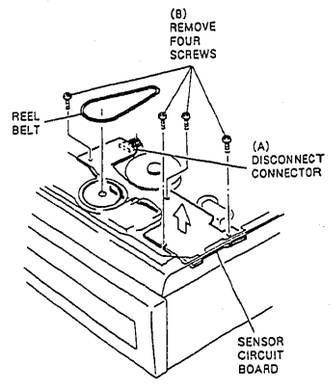
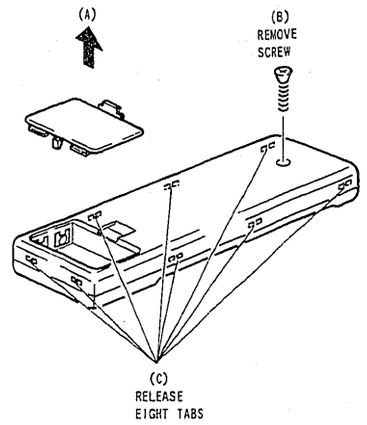


Fig. 3-5

7. Remote Controller



Refer to the VT-M150A/M151A,AW servise manual (No.3472E) for the removal of the mechanical components.

CHAPTER 3

ELECTRIC CIRCUIT ADJUSTMENT

Test equipment and tapes necessary for adjustment

1) Dual-trace oscilloscope
2) Color bar generator
3) VTVM
4) DC voltmeter
5) Frequency counter
6) Monitor TV (with A/V jacks)
7) Alignment tapes
   - MH-1 : Parts No. 7099046
   - 30HMP2-1 : Parts No. 7099089
8) Blank tape

Cautions on adjustments

1) If there are no special instructions, the following conditions apply.
   - Oscilloscope probe: 10:1
   - Oscilloscope synchronization: Internal sync
   - Ground of test equipment: TP602 (GND) on Main P.C.B
2) When making more than one adjustment, perform the adjustments in the order listed.

Servicing positions

The circuit boards can be set to the servicing positions as follows when servicing and adjusting the VCR.

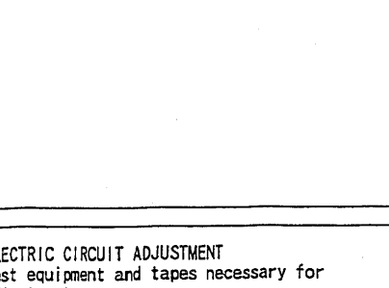


Fig. 1

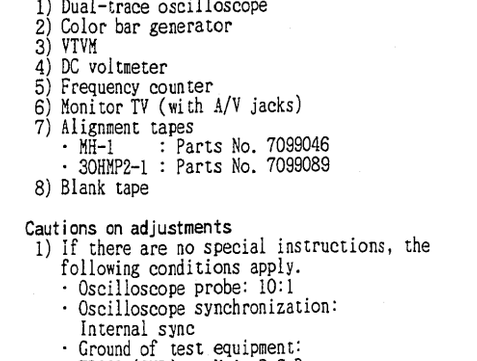


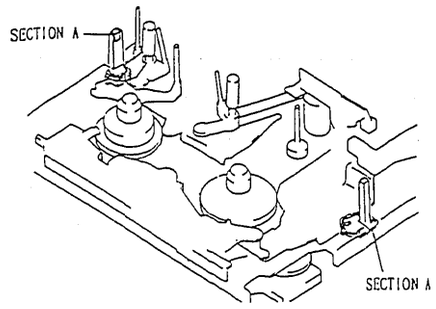
Fig. 2

Usable servicing methods

1. **To reset the microprocessor**
   All microprocessors installed in the unit will be reset once the AC power cord is removed from the AC outlet. However, the timer microprocessor is not reset for about 1 hour because it is backed up by the power backup circuit.

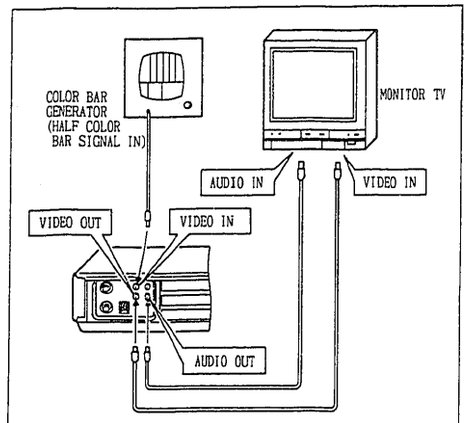
2. **To set the VCR to the loading state without loading a cassette**
   1) Unplug the power cord from the AC outlet.
   2) Cover the supply and take-up end sensors (sections A in the figure below) with black masking tape, etc. to shut off the light.
   3) Plug the power cord into an AC outlet.
   4) Turn the VCR on.
   The VCR can accept the inputs of each mode in this state. However, the rewind operation cannot be performed for more than a few seconds because the take-up reel disk is in the stop state and reel pulses cannot be detected.

   [Cautions]
   Always return the VCR to the original state in the following order after the above operations have been completed.
   1) Remove the masking tape, etc. from the supply and take-up end sensors.
   2) Unplug the power cord from the AC outlet once to reset the system control microprocessor.



3. **To set the tracking to the center**
   If Tracking : Center is specified, press the TRACKING UP(▲) and DOWN(▼) buttons simultaneously to set tracking to the center.

4. **Test equipment connection**
   · Connect test equipment as shown when not otherwise specified.



Setting the conditions of VCR
(1) Set to the external input mode.

Adjustment Parts Locations

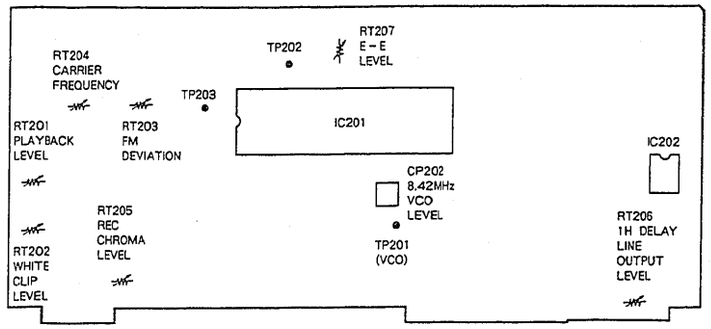


Fig. 1 Luminance/Chroma Circuit Board (Component Side)

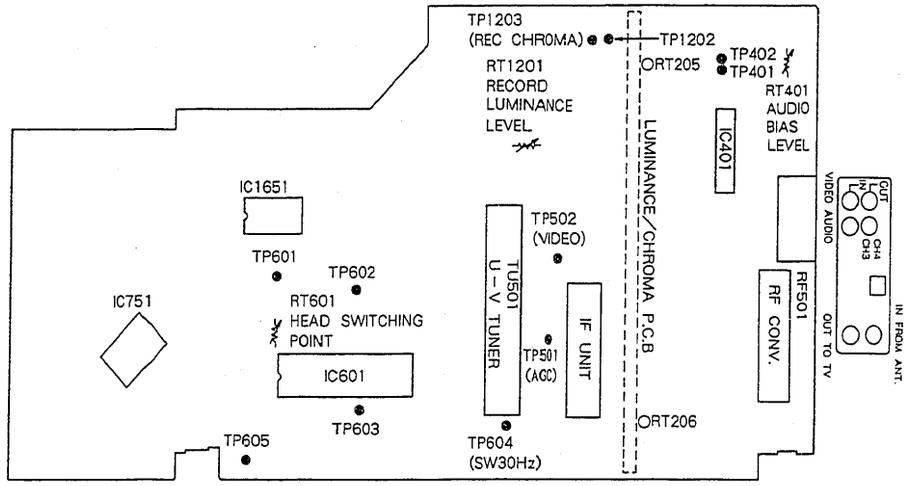


Fig. 2 Main Circuit Board (Solder Side)

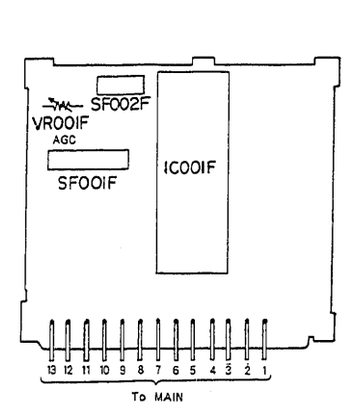


Fig. 3 IF Circuit Board (Component Side)

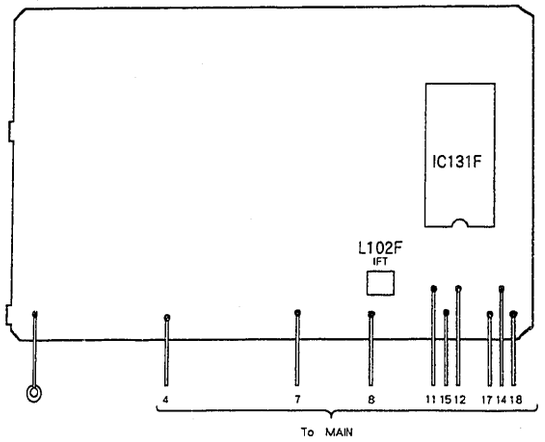


Fig. 4 U-V Tuner Circuit Board (Component Side)

1. SERVO CIRCUIT ADJUSTMENT

1. Head Switching Point Adjustment

Purpose of adjustment and fault occurring if incomplete

Purpose: To set the video head switching point during play to approximately the center where the CH-1 and CH-2 envelopes overlap each other.

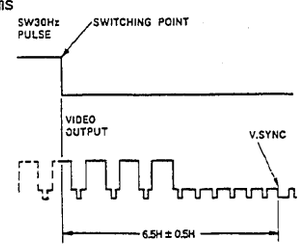
Fault:
- The vertical sync signal is degraded and vertical jitter occurs.
- Switching noise appears across the bottom of the screen.

Test Equipment/Jigs	Test Equipment Connection Points	VCR State	Adjustment Point
· Oscilloscope	· CH-1: VIDEO OUT · CH-2: TP604(SW30)	· Play alignment tape (color bar signal)	· RT601 (SWITCHING POINT)
· Alignment tape (MH-1) (Parts No.7099046)			

Adjustment Procedure

Vertical sync signal:
Set to 6.5H±0.5H from the trailing edge (trigger position) of the SW30Hz pulse.
<Settings of oscilloscope>
· Trigger with CH-2.
· Set the sync slope to "-".

Waveforms



2. VIDEO CIRCUIT ADJUSTMENTS

1. E-E Level Adjustment

Purpose of adjustment and fault occurring if incomplete

Purpose: Set the luminance level to the specified value in the E-E mode.

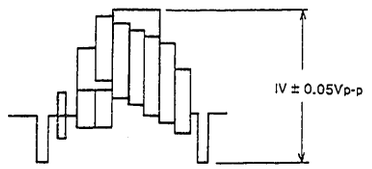
Fault: The brightness is different between the input and output signals.

Test Equipment/Jigs	Test Equipment Connection Points	VCR State	Adjustment Point
· Color bar generator · Oscilloscope	· VIDEO IN · VIDEO OUT	· Apply a color bar signal and set the VCR to the E-E mode.	· RT207 (E-E Level)

Adjustment Procedure

1) Adjust RT207 so that the color bar level is 1Vp-p±0.05Vp-p. (75Ω Terminated)

Waveforms



2. White Clip Level Adjustment

Purpose of adjustment and fault occurring if incomplete

Purpose:

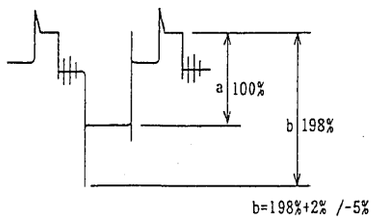
Fault:

Test Equipment/Jigs	Test Equipment Connection Points	VCR State	Adjustment Point
· Oscilloscope (200mV/div.,20μs/div.)	· CH-1: TP203	· Apply a color bar signal and set the VCR to the EE mode.	· RT202 (WHITE CLIP LEVEL)
· Color bar generator	· VIDEO IN		

Adjustment Procedure

1) Adjust RT202 so the relationship between levels (a) and (b) is obtained as shown in the diagram on the right.

Waveforms



3. FM Carrier and Deviation Adjustment

Purpose of adjustment and fault occurring if incomplete

Purpose: Sets the FM carrier frequency and deviation to the specified values.

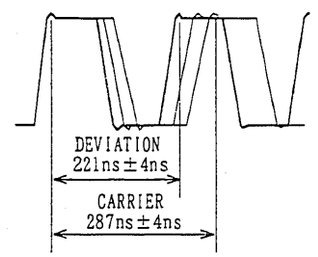
Fault: The picture is distorted when tapes recorded by other VCRs are played by this VCR and compatibility is not obtained.

Test Equipment/Jigs	Test Equipment Connection Points	VCR State	Adjustment Points
· Color bar generator · Oscilloscope · Blank tape	· VIDEO IN · IC201 Pin15	· Receive a white(100%) signal (line input) · REC mode · EP mode	· RT204 (Carrier Frequency) · RT203 (FM Deviation)

Adjustment Procedure

1) Connect an oscilloscope to IC201-pin15.
2) Set the scope to (+) and adjust the RT204 so the period of the widest pulse is 287ns±4ns.
3) Set the scope to (+) and adjust the RT203 so the period of the narrowest pulse is 221ns±4ns.

Waveforms



4. Playback Level Adjustemnt

Purpose of adjustment and fault occurring if incomplete

Purpose: To set the playback level to the specified value.

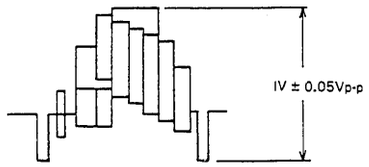
Fault: The brightness of the picture during playback is different from that during recording.

Test Equipment/Jigs	Test Equipment Connection Points	VCR State	Adjustment Point
· Color bar generator · Oscilloscope · Blank tape	· VIDEO IN · VIDEO OUT	· Receive a color bar signal (line input) · REC mode · EP mode	· RT201 (PLAYBACK LEVEL)

Adjustment Procedure

1) Playback the recorded signal and adjust RT201 so that the color bar level is 1Vp-p±0.05Vp-p. (75Ω Terminated)

Waveforms



5. 8.42MHz VCO Level Adjustment

Purpose of adjustment and fault occurring if incomplete

Purpose: To set the VCO oscillation frequency.

Fault: Colors are displaced or color disappears.

Test Equipment/Jigs	Test Equipment Connection Points	VCR State	Adjustment Point
· Color bar generator · DC Voltmeter	· VIDEO IN · TP201	· Receive a color bar signal (Line input) (E-E mode)	· CP202 (8.42MHz VCO LEVEL)

Adjustment Procedure

1) Adjust CP202 so the DC level is 2.35±0.05V.

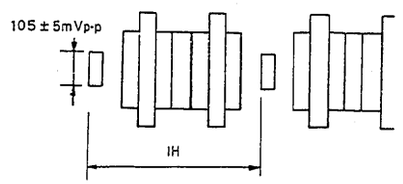
6. Record Chroma Level Adjustment

Purpose of adjustment and fault occurring if incomplete	
Purpose: To set the record chroma level to an optimum value.	**Fault:** Beats may occur or the color may become poor.

Test Equipment/Jigs	Test Equipment Connection Points	VCR State	Adjustment Points
· Color bar generator · Oscilloscope · Blank tape	· VIDEO IN · TP1203(Rec Chroma)	· Receive a color bar signal (Line input) · REC mode · EP mode	· RT205 (REC CHROMA LEVEL)

Adjustment Procedure
1) Adjust RT205 so that the color burst level is 105±5mVp-p.

Waveforms



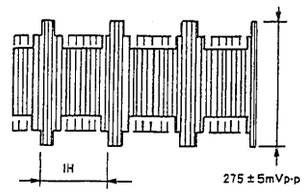
7. Record Luminance Level Adjustment

Purpose of adjustment and fault occurring if incomplete	
Purpose: To set the record luminance level to an optimum value.	**Fault:** · The played back picture becomes dark and noise increases, or the picture glares and becomes whitish.

Test Equipment/Jigs	Test Equipment Connection Points	VCR State	Adjustment Points
· Color bar generator · Oscilloscope · Blank tape	· VIDEO IN · TPIP (Pre/Rec Amp)	· Receive a color bar signal.(Line input) · REC mode · EP mode	· RT1201 (REC Y LEVEL)

Adjustment Procedure
1) Adjust RT1201 so that the level is 275±5mVp-p.

Waveforms



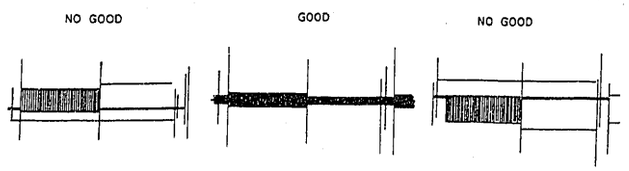
8. 1H Delay Line Output Level Adjustment

Purpose of adjustment and fault occurring if incomplete	
Purpose: To set the input and output levels of the CCD 1H DELAY LINE the same.	**Fault:** Switching noise is conspicuous when dropout is compensated.

Test Equipment/Jigs	Test Equipment Connection Points	VCR State	Adjustment Point
· Oscilloscope · Alignment tape (MH-1) (Parts No.7099046)	· CH-1: TP202 · CH-2: TP604 (SW30)	· Play alignment tape (Color bar signal)	· RT206 (1H DELAY LINE OUTPUT LEVEL)

Adjustment Procedure
1) Adjust RT206 to minimize level at the waveform.

Waveforms



3. AUDIO CIRCUIT ADJUSTMENT

1. Audio Bias Level Adjustment

Purpose of adjustment and fault occurring if incomplete	
Purpose: To set the recording bias to the optimum level.	**Fault :** · Bias too high : High-frequency response deteriorates. · Bias too low : Sound tends to be distorted.

Test Equipment/Jigs	Test Equipment Connection Points	VCR State	Adjustment Points
· VTVM	· TP401(REC BIAS) · TP402(BIAS GROUND)	· No-signal record mode (SP mode)	· RT401(AUDIO BIAS LEVEL)

Adjustment procedure
1) Reading of VTVM : 2.6mV±0.1mVrms.

4. IF/TUNER CIRCUIT ADJUSTMENT

1. AGC Adjustment

Purpose of adjustment and fault occurring if incomplete	
Purpose: The AGC adjustment determines the point where the AGC is activated.	**Fault:**

Test Equipment/Jigs	Test Equipment Connection Points	VCR State	Adjustment Points
· RF NTSC color bar generator · DC Voltmeter	· VHF IN · U-V TUNER 6(AGC)	· Receive a color bar signal.(RF input)	· VR001F (AGC)

Adjustment Procedure
1) Set the VCR/TV select switch to VCR.
2) Supply a 199.25MHz/-43dBm RF NTSC color bar signal with 87.5% modulation to the VHF antenna terminal.
3) Tune in the RF channel supplied by the NTSC color bar generator (select channel 11).
4) Adjust VR001F for 5.1±0.1V DC.

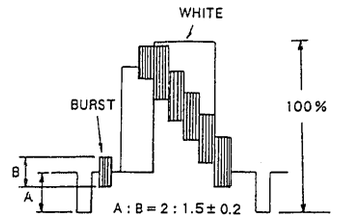
2. IFT Adjustment

Purpose of adjustment and fault occurring if incomplete	
Purpose: To set the chroma level to the specified value.	**Fault:**

Test Equipment/Jigs	Test Equipment Connection Points	VCR State	Adjustment Point
· RF NTSC color bar generator · Oscilloscope	· VHF IN · IF UNIT-2(VIDEO)	· Receive a color bar signal.(RF input)	· IFT

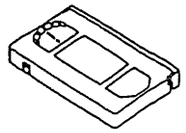
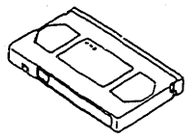
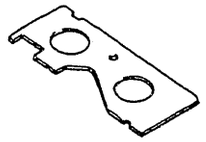
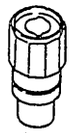
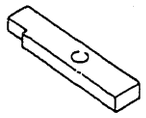
Adjustment Procedure
1) Set the VCR/TV select switch to VCR.
2) Supply a 199.25MHz/-43dBm RF NTSC color bar signal with 87.5% modulation to the VHF antenna terminal.
3) Tune in the RF channel supplied by the NTSC color bar generator (select channel 11).
4) Adjust the core of the IFT so the ratio between SYNC level (A) and burst level (B) is 2 : 1.5 .
(Note: Check that the yellow level of the chroma signal does not exceed the 100% white level. If it does, readjust the core.)

Waveforms



MECHANISM ADJUSTMENT

JIGS AND TAPES FOR ADJUSTMENT

1. Back Tension Meter Parts No.7099004 	2. Alignment Tape - MH-1 - Parts No. 7099046 - 30HMP2-1 - Parts No. 7099089 	3. Master Plane Parts No.7099279 
4. Torque Gauge Parts No.7099039 	5. Torque Gauge Adapter Parts No.7099035	6. Reel Disk Height Jig Parts No.7099038 
7. 1.5mm Hexagonal Wrench 0.9mm Hexagonal Wrench		

Refer to pages 4-1 to 4-15 the VT-M150A/M151A,AW servise manual(No.3472E) for the adjustment of the mechanism.

SCHEMATIC/CIRCUIT BOARD DIAGRAMS

BEFORE USING THIS SERVICE REFERENCE MATERIAL

How to read abbreviations

(Resistors)

R210 150K

	Value	Not indicated .. Ω(ohm) K ..... kΩ
	Tolerance	Not indicated .. ±5% K ..... ±10% M ..... ±20%
	Wattage	Not indicated .. 1/8W (All values other than 1/8W are indicated in the schematic diagrams with W omitted)
	Sort	Not indicated .. Carbon film RC ..... Carbon solid RW ..... Wire wound RS ..... Metal oxide film RN ..... Metal film

Example:
R120 ..... 150kohm, carbon solid
RC1/2K 1/2W, ±10%

(Capacitors)

C210 0.01/25

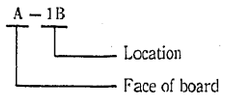
	Value	Not indicated .. μF P ..... PF
	Dielectric strength	Not indicated .. 50WV (All values other than 50WV and electrolytic capacitors are indicated in the schematic diagrams with WV omitted)
	Tolerance	Not indicated .. ±10% J ..... ±5% M ..... ±20% C ..... ±0.25PF Z ..... +80% -20% (No tolerance is indicated for electrolytic capacitors (excluding tantalum and high stability electrolytic capacitors))
	Sort	Not indicated .. Ceramic General electrolytic (distinguished from ceramic with circuit symbol) MYL ..... Mylar (polyester film) STY ..... Styrol TA ..... Tantalum KU ..... High stability electrolytic MP ..... Metalized paper

Example:
C210
0.01/25 ... Mylar, 0.01μF, 25WV, ±5%
MYL J

Notes:

1. Voltages are measured with the negative ⊖ terminal of the power supply as reference in the normal operating mode. The voltages in different modes are indicated in the schematic diagrams; those in parentheses ( ) are in the record mode and those without parentheses are in the play mode.
2. The value, dielectric strength (wattage), tolerance and sort of resistors (excluding variable resistors, etc.) and capacitors are indicated in the schematic diagrams by abbreviations. Replace them correctly, comparing the abbreviations in the schematic diagrams and the table "how to read abbreviations".

How to read locations of semiconductors:

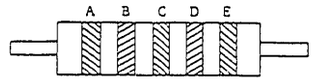


Cautions on use of MOS IC

1. The MOS IC is inserted in black foam for shipment. This foam is a conductor which short-circuits between the leads to prevent damage. Do not remove ICs from this foam during their storage. Avoid removing ICs from this foam, placing them on plastic which is likely to be charged with static electricity or inserting them into styrol foam.
2. High voltages may be applied during soldering caused by leakages from the soldering iron, so be sure to ground the tip of the soldering iron or use a low voltage soldering iron.
3. The human body, clothes made of synthetic fibres or nylon gloves may be charged with several thousands volts of static electricity because of friction, so a worker should be earthed.
4. Be sure to earth measuring instruments such as oscilloscopes, VTVMs, etc. used for repairs.

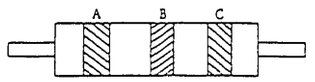
How to read capacity and inductance of resistor shape capacitors and coils

CAPACITOR



CAPACITY: (10A+B) x C (PF)
TOLERANCE: D
RATED VOLTAGE: BODY COLOUR
PINK: 25V
GREEN: 50V
CHARACTERISTICS: E

COIL



INDUCTANCE: (10A+B) x C (μH)

COLOUR	A,B	C	D	E
Black	0	10^0	±20%	For temperature compensation
Brown	1	10^1		
Red	2	10^2		
Orange	3	10^3		
Yellow	4	10^4		
Green	5	10^5		
Blue	6			
Violet	7			
Grey	8		±30%	High dielectric constant type
White	9			For temperature compensation
Gold		10^{-1}	±5%	
Silver		10^{-2}	±10%	High dielectric constant type

SERVICE MANUAL ABBREVIATION LIST

A	
A.DUB	Audio Dub
ACC	Automatic Color Control
ACK	Automatic Color Killer
ADD	Adder
AFC	Automatic Frequency Control
AGC	Automatic Gain Control
ALC	Automatic Level Control
ASBL	Assemble (Phase Matching)
APC	Automatic Phase Control
AUX	Auxiliary
B	
BATT.	Battery
BG	Burst Gate or Back Ground
BGP	Burst Gate Pulse
BH	Power Supply for Selecting VHF High Band
BL	Power Supply for Selecting VHF Low Band
BPF	Band-pass Filter
BS	Power Supply for Selecting VHF Super Band
BU	Power Supply for Selecting UHF Band
BUF.	Buffer Amplifier
C	
C	Chroma
C.FG/CFG	Capstan Frequency Generater
C.MEMORY	Counter Memory
C.PAUSE	Camera Pause
C.RESET	Counter Reset
C.REVERSE	Count Reverse
C.SYNC	Composite Synchronizing Signal
C/R	Capacitor/Resistor
CATV	Cable TV
CAPST.	Capstan
CCD	Charge Coupled Device
CH	Channel
CNR	Chroma Noise Reducer
CHAR.	Character
COM.	Common
COMP-EXP	Compressor-Expander
COMPA	Comparator
COMPE	Compensator
COM.	Composite
CONV.	Converter
CORR.	Correlation
COUNT.	Counter
CST	Cassette
CTL	Control Track Pulse
CYL.	Cylinder
D	
D/A	Digital to Analog
D/W	Dark/White
DA	Double Azimuth
DEEMPH.	Deemphasis
DEMOD.	Demodulator
DET	Detector
DISCRI.	Discriminator
DISP.	Display
DL	Delay line
DN	Down
DO	Dropout
DOC	Dropout Compensator
E	
E-E	Electronic-to-Electronic
EA-ROM	Electrically Alterable Read Only Memory
EMPH	Emphasis
EQ	Equalizer
EXT.	External
F	
FF	Flip Flop
F.FWD	Fast Forward
FG	Frequency Generator
FM	Frequency Modulation
FRAME ADV./F.ADV	Frame Advance
fsc	Color Sub Carrier Frequency
FWD	Forward
G	
GEN	Generator
GND	Ground
H	
HD	Horizontal Drive
Hi-Fi	High Fidelity
HPF	High-pass Filter
HPL	High-pass Limiter
HSS	Horizontal Sync. Separator
I	
I/O	In/Out (Input/Output)
IF	Intermediate Frequency
INDI.	Indicator
INT.	Internal
INV.	Inverter
IR	Infrared Rays
IRT	Instant Recording Timer
L	
LCD	Liquid Crystal Display
LIN.	Linear
LNC	Line Noise Canceller
LM	Loading Motor
LOG.	Logarithm
LPF	Low-pass Filter
L/R	Left/Right
LP	Long play
M	
M.CUT	Monitor Cut
M.STATE	Mechanism State
M.STOP	Memory Stop
MEM.	Memory
MIX	Mixer
MM	Monostable Multivibrator
MOD.	Modulator
MPX	Multiplex
MTS	Multi Channel Television Sound
N	
NF	Negative Feed Back
NORM.or NOR.	Normal
NR	Noise Reduction

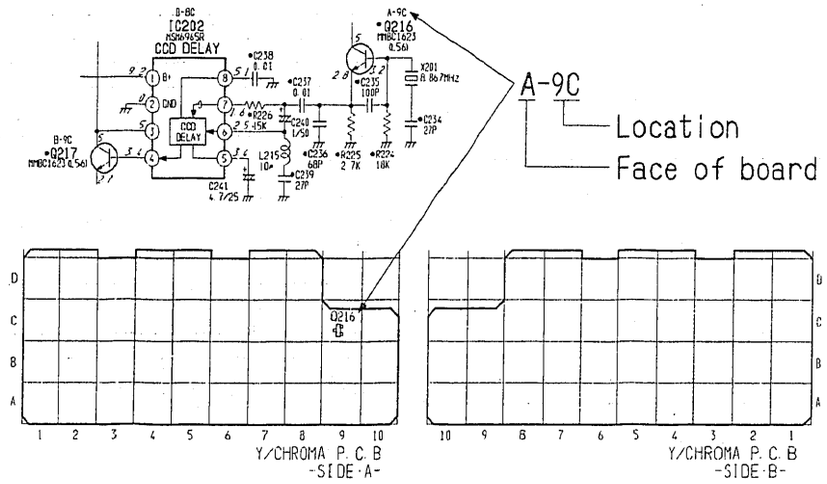
O	
OSC	Oscillator
OSD	On-Screen Display
P	
PB/PLAY	Playback
PIF	Picture Intermediate Frequency
PLL	Phase Locked Loop
POS.	Positive
POWER CONT.	Power Control
PROG.	Program
PROTECT.	Protector
PWM	Pulse Width Modulation
R	
REC	Record
RECT.	Rectifier
REF	Reference
REG	Regulator
REV	Reverse
REW	Rewind
RF	Radio Frequency
RAM	Randum Access Memorey
ROM	Read Only Memory
S	
S/H	Sample and Hold
S.REEL	Supply Reel Sensor
S.TRACK.	Slow Tracking
S-VHS	Super VHS
SAW	Sawtooth
SAP	Second Audio Program
SEP.	Separator
SIF	Sound Intermediate Frequency
SP	Standard Play
SRCH	Search
SRV	Servo
SW 25Hz	Head Switching Pulse
SYNC	Synchronizing Signal
SYS.CON	System Control
T	
T/L	Tuner/Line
T.BRAKE	Take-up Brake
TμP	Timer Microprocessor
T.REEL	Take-up Reel Sensor
T.RESET	Timer Reset
TP	Test Point
TRS	Transfer
TU-μP	Tuning Microprocessor
U	
U/D	Up/Down
UNI.	Unified
V	
V-REF	Voltage Reference
V.DRV	Vertical Drive Pulse
V.DUB	Video Dub
VAR.	Variable
VCA	Voltage Controlled Amplitier
VCO	Voltage Controlled Oscillator
VHS	Video Home Systems
Vss	Voltage Super Source
VOL.	Volume
VSS	Vertical Sync. Separator
VT	Tuning Voltage
VT-U	Tuning Voltage-UHF
VT-V	Tuning Voltage-VHF
W	
WE	Weighting
Y	
Y/C	Luminance/Chrominance

DIGITAL PROCESS CIRCUIT

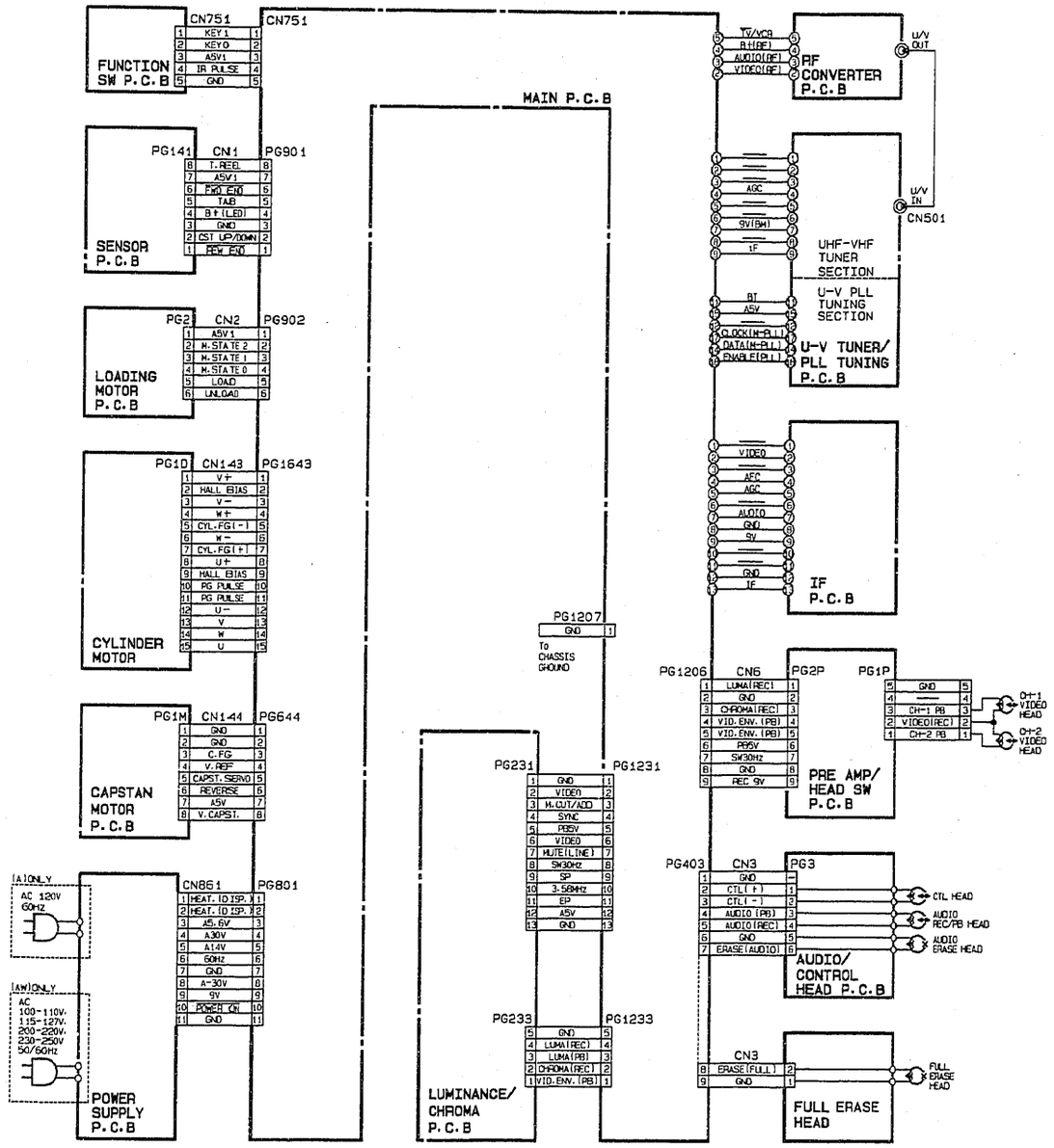
A	
ADC B-Y	Analog to Digital Converted B-Y Signal
ADC R-Y	Analog to Digital Converted R-Y Signal
ADC Y	Analog to Digital Converted Luminance
ADRS	Address
C	
CAS	Column Address Strobe
C.BLANK	Chroma Blanking
D	
DRAM	Dynamic Random Access Memory
DEMPX	Demultiplexer
DWC	Delayed Write Clock
DT/OE	Data Transfer /Output Enable
D.REF 25	Delayed Reference 25Hz
D.SW 25	Delayed Switching 25Hz
I	
INC	Row Counter Increment
M	
MEM	Memory
MEM VIDEO	Memorized Video
MEM SW	Memory Switch
MEM ON	Memory ON
MPX	Multiplexer
MPX VIDEO	Multiplexed Video
O	
O/E	Odd/Even Field
P	
P IN P	Picture in Picture
PIX MOVE	Picture Move
R	
RC	Reading Clock
RCC	Reading Clock Clear
RCR	Row Counter Reset
RAS	Row Address Strobe
REF 25	Reference 25Hz from servo circuit
REL	Refresh Control
S	
SC	Serial Control
W	
WC	Write Clock
WCC	Write Clock Clear
WRITE ENBL (WE)	Write Enable

[Indications of semiconductor locations]

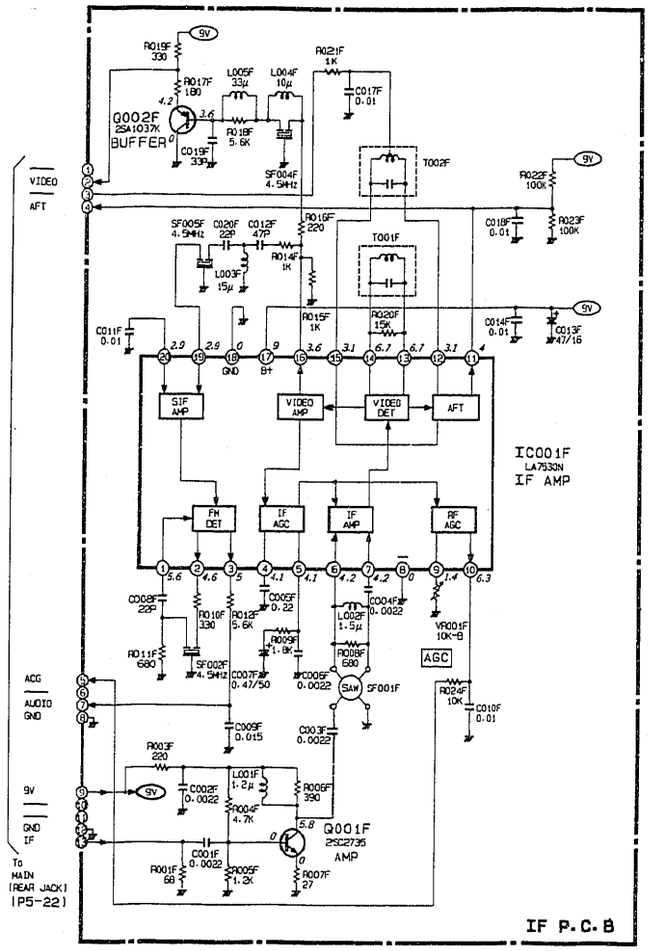
The locations of semiconductors (ICs, transistors, diodes, etc.) are shown in the schematic diagrams in this service manual. Use the indications to locate the parts on the circuit boards.



INTERNAL WIRING DIAGRAM

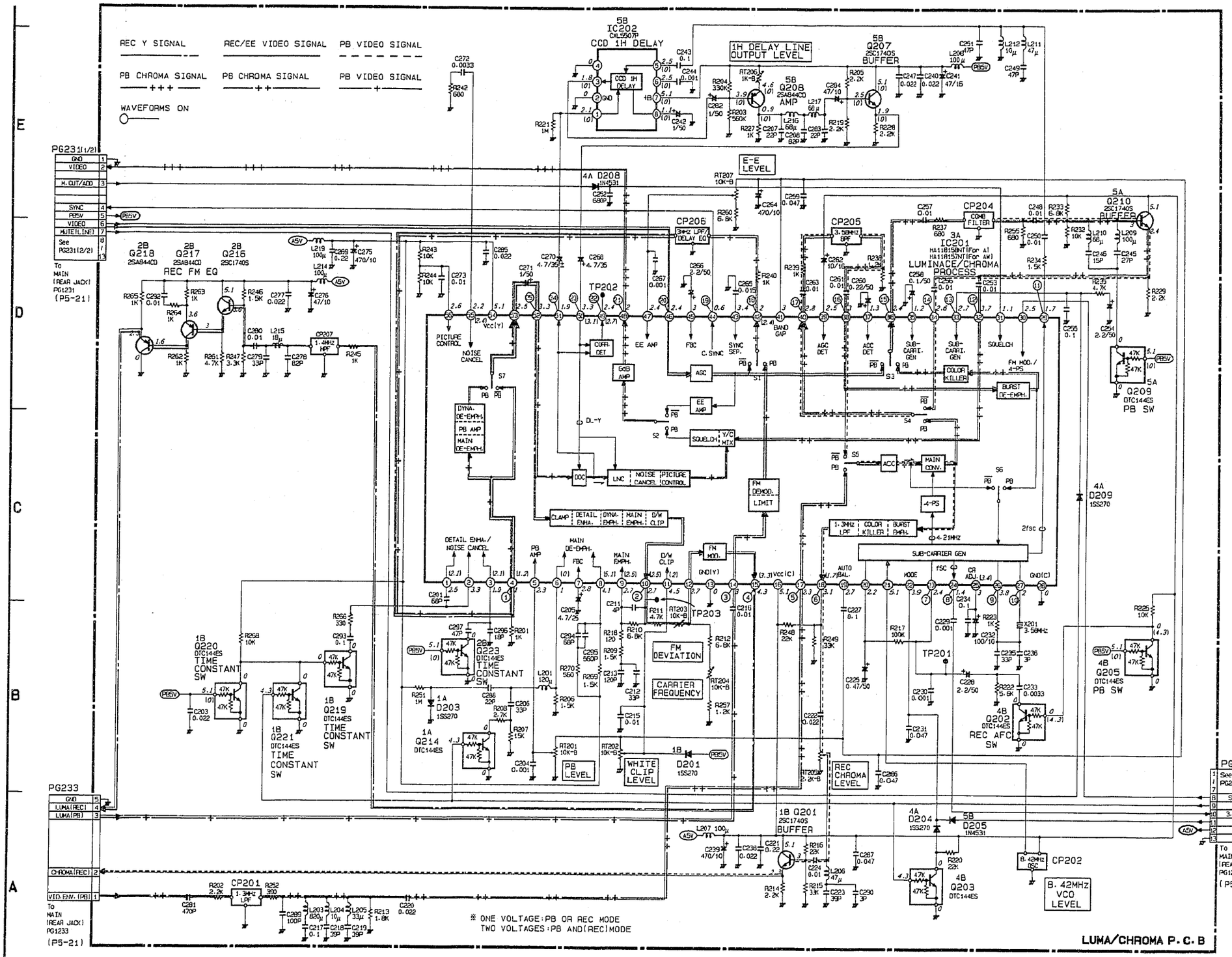


IF SCHEMATIC DIAGRAM



※ ONE VOLTAGE:PB OR REC MODE
TWO VOLTAGES:PB AND(REC)MODE

LUMINANCE/CHROMA SCHEMATIC DIAGRAM

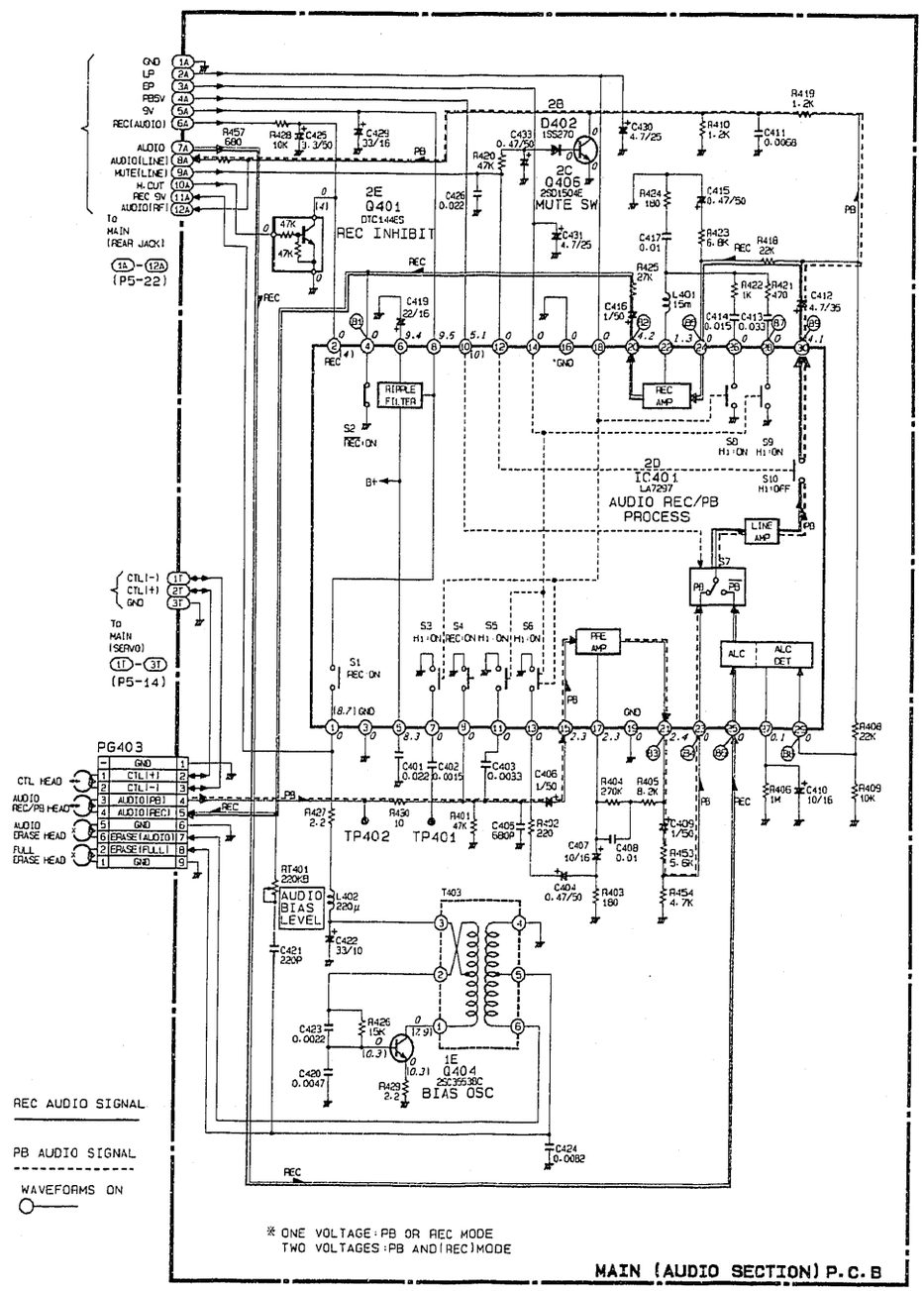


LUMINANCE/CHROMA WAVEFORMS

1-A IC201-4 500mVp-p 0.2V/20.0μ sec.cm REC	7-A IC201-23 60mVp-p 20mV/5.0μ sec.cm REC/PLAY	13-A IC201-33 72mVp-p 20mV/10.0μ sec.cm REC/PLAY	17-B IC201-40 200mVp-p 50mV/20.0μ sec.cm PLAY	23-A IC201-50 90mVp-p 50mV/20.0μ sec.cm REC
1-B IC201-4 200mVp-p 0.1V/20.0μ sec.cm PLAY	8-A IC201-24 550mVp-p 0.2V/200nsec.cm REC/PLAY	14-A IC201-34 70mVp-p 20mV/20.0μ sec.cm REC	18-A IC201-42 970mVp-p 0.2V/20.0μ sec.cm REC	23-B IC201-50 600mVp-p 0.2V/20.0μ sec.cm PLAY
2-A IC201-10 1.2Vp-p 0.5V/20.0μ sec.cm REC	9-A IC201-26 1.4Vp-p 0.5V/200nsec.cm REC	14-B IC201-34 95mVp-p 20mV/20.0μ sec.cm PLAY	18-B IC201-42 590mVp-p 0.2V/20.0μ sec.cm PLAY	24-A IC201-51 480mVp-p 0.1V/20.0μ sec.cm REC
3-B IC201-14 350mVp-p 0.1V/5.0msec.cm PLAY	9-B IC201-26 1.4Vp-p 0.5V/200nsec.cm PLAY	15-A IC201-36 1.0Vp-p 0.2V/20.0μ sec.cm REC	19-A IC201-44 5.2Vp-p 2V/20.0μ sec.cm REC/PLAY	24-B IC201-51 600mVp-p 0.1V/20.0μ sec.cm PLAY
4-A IC201-15 900mVp-p 0.2V/20.0μ sec.cm REC	10-A IC201-27 600mVp-p 0.2V/200nsec.cm REC/PLAY	15-B IC201-36 500mVp-p 0.2V/20.0μ sec.cm PLAY	20-A IC201-46 2.0Vp-p 0.5V/20.0μ sec.cm REC	25-A IC201-52 490mVp-p 0.1V/20.0μ sec.cm REC
5-B IC201-17 50mVp-p 20mV/5.0msec.cm PLAY	11-A IC201-29 620mVp-p 0.2V/100nsec.cm REC/PLAY	16-A IC201-38 150mVp-p 50mV/20.0μ sec.cm REC	21-A IC201-48 2.0Vp-p 0.5V/20.0μ sec.cm REC	25-B IC201-52 600mVp-p 0.1V/20.0μ sec.cm PLAY
6-A IC201-18 190mVp-p 50mV/20.0μ sec.cm REC	12-A IC201-32 70mVp-p 20mV/20.0μ sec.cm REC	16-B IC201-38 60mVp-p 20mV/20.0μ sec.cm PLAY	21-B IC201-48 2.3Vp-p 0.5V/20.0μ sec.cm PLAY	
6-B IC201-18 68.0mVp-p 20mV/5.0μ sec.cm PLAY	12-B IC201-32 98mVp-p 20mV/20.0μ sec.cm PLAY	17-A IC201-40 340mVp-p 0.1V/20.0μ sec.cm REC	22-A IC201-49 1Vp-p 0.2V/20.0μ sec.cm REC	

DIAGRAM CONFIGURATION	SCHEMATIC DIAGRAM	CIRCUIT BOARD DIAGRAM
IF	5-6	-
LUMINANCE/CHROMA	5-7	5-27
AUDIO	5-10	5-25
CYL.MOTOR DRIVE	5-12	5-25
CAPSTAN MOTOR	5-12	-
SERVO	5-13	5-25
PRE/REC AMP	5-15	-
SENSOR	5-15	5-29
RF CONVERTER	5-16	-
FUNCTION SW	5-16	5-26
SYS.CON./TIMER	5-17	5-25
POWER SUPPLY	5-19	5-27
REAR JACK	5-21	5-25
U-V TUNER	5-23	-

AUDIO SCHEMATIC DIAGRAM



SERVO WAVEFORMS

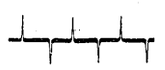
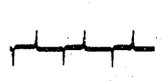
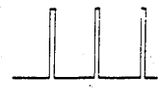
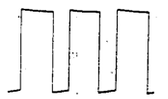
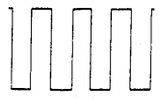
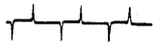
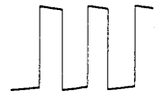
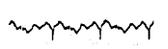
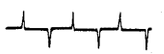
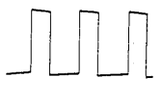
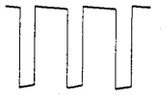
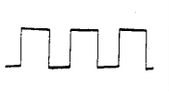
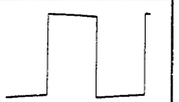
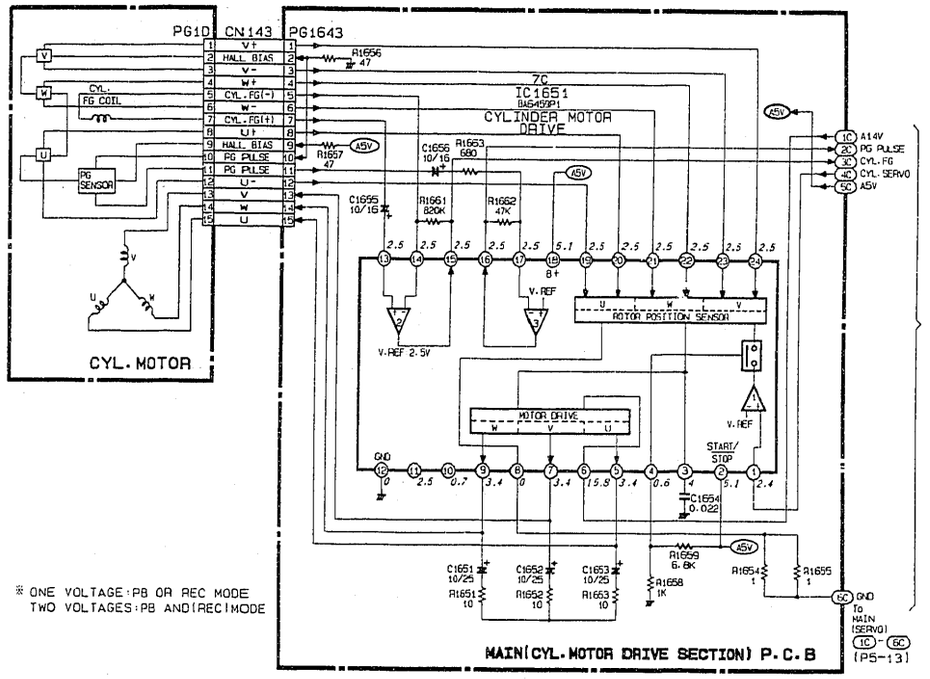
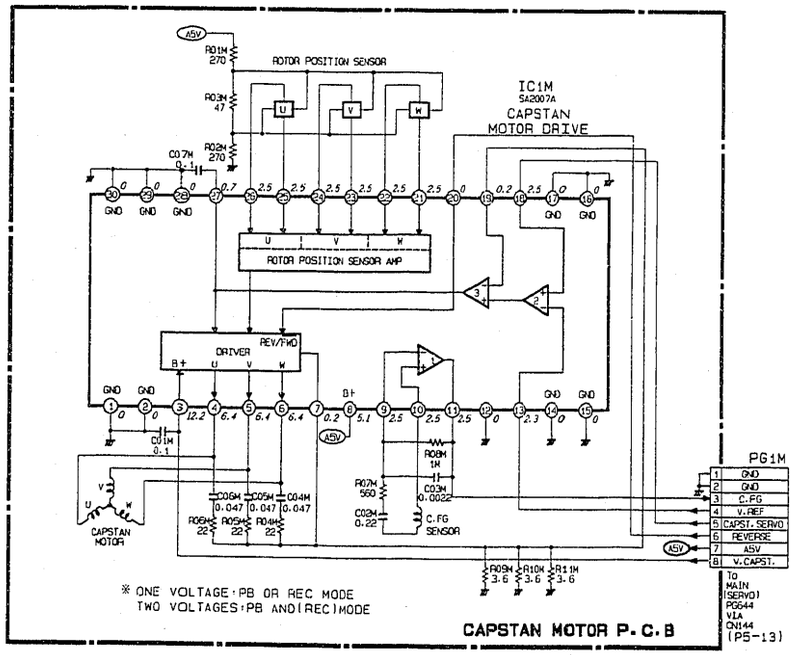
51-A TP604 1.9Vp-p 0.5V/10.0msec.cm REC/PLAY	58-B IC601-34 2.2Vp-p 1V/10.0msec.cm PLAY	64-A IC601-50 5.2Vp-p 1V/20.0μ sec.cm REC/PLAY
		
52-A IC601-1 5.8Vp-p 2V/10.0msec.cm REC/PLAY	59-A IC601-35 660mVp-p 0.2V/10.0msec.cm REC	65-A IC601-55 5.7Vp-p 1V/500μ sec.cm REC/PLAY
		
53-A IC601-6 2.8Vp-p 0.5V/2.0msec.cm REC/PLAY	59-B IC601-35 2.1Vp-p 1V/10.0msec.cm PLAY	66-A IC601-56 5.8Vp-p 1V/10.0msec.cm REC/PLAY
		
54-A IC601-7 2.3Vp-p 0.5V/10.0msec.cm REC/PLAY	60-A IC601-36 660mVp-p 0.2V/10.0msec.cm REC	
		
55-A IC601-9 4.0Vp-p 1V/1.0msec.cm REC/PLAY	60-B IC601-36 2.2Vp-p 1V/10.0msec.cm PLAY	
		
56-A IC601-29 6.5Vp-p 2V/10.0msec.cm REC	61-A IC601-39 5.6Vp-p 1V/10.0msec.cm REC/PLAY	
		
57-A IC601-30 2.6Vp-p 1V/10.0msec.cm REC	62-A IC601-42 510mVp-p 0.1V/200nsec.cm REC/PLAY	
		
58-A IC601-34 680mVp-p 0.2V/10.0msec.cm REC	63-A IC601-45 5.8Vp-p 1V/10.0msec.cm REC/PLAY	
		

DIAGRAM CONFIGURATION	SCHEMATIC DIAGRAM	CIRCUIT BOARD DIAGRAM
IF	5-6	-
LUMINANCE/CHROMA	5-7	5-27
AUDIO	5-10	5-25
CYL.MOTOR DRIVE	5-12	5-25
CAPSTAN MOTOR	5-12	-
SERVO	5-13	5-25
PRE/REC AMP	5-15	-
SENSOR	5-15	5-29
RF CONVERTER	5-16	-
FUNCTION SW	5-16	5-26
SYS.CON./TIMER	5-17	5-25
POWER SUPPLY	5-19	5-27
REAR JACK	5-21	5-25
U-V TUNER	5-23	-

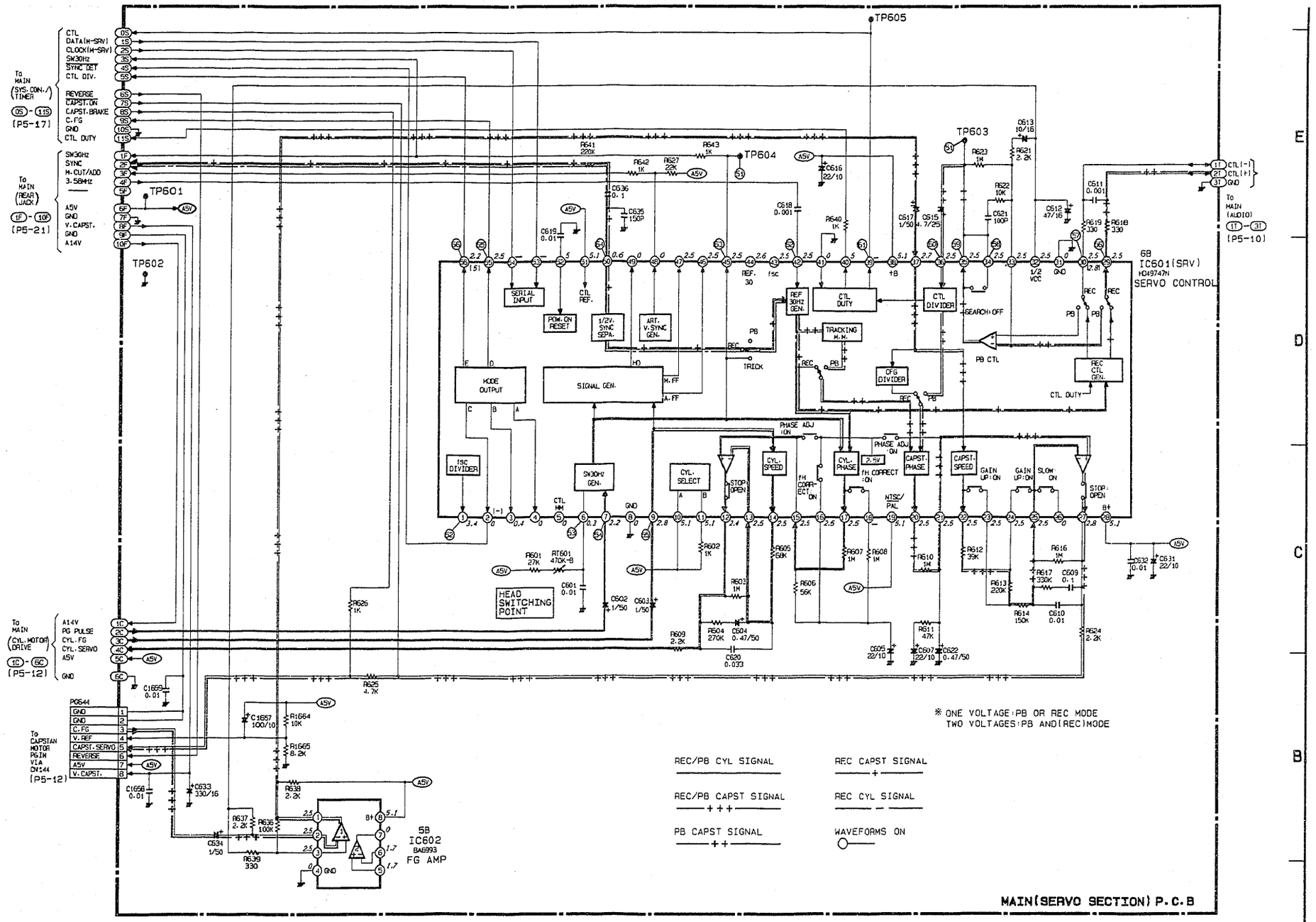
CYL. MOTOR DRIVE SCHEMATIC DIAGRAM



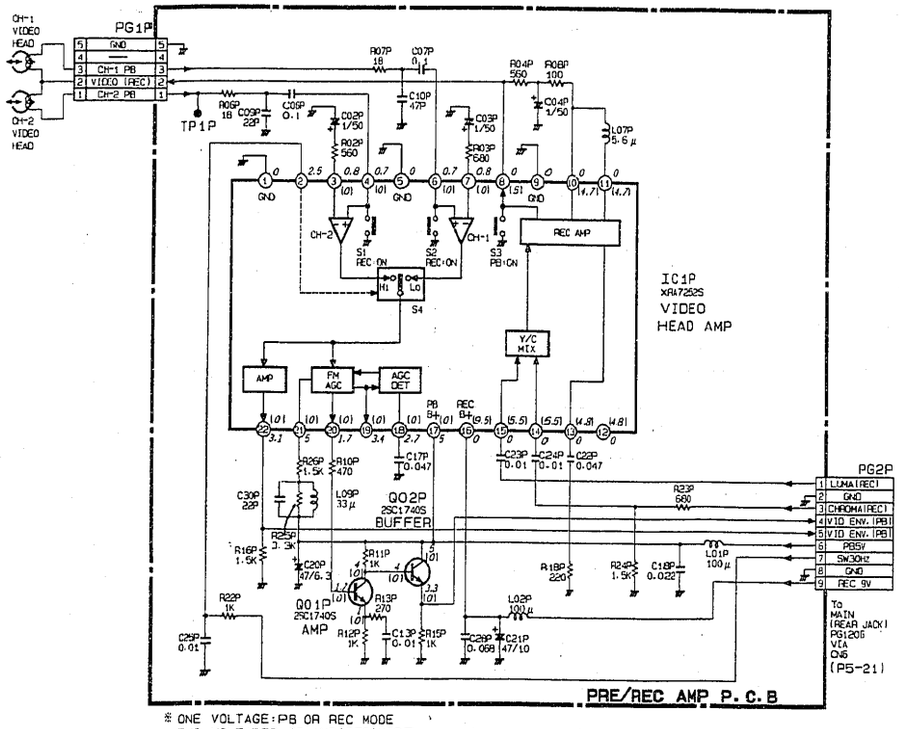
CAPSTAN MOTOR SCHEMATIC DIAGRAM



SERVO SCHEMATIC DIAGRAM

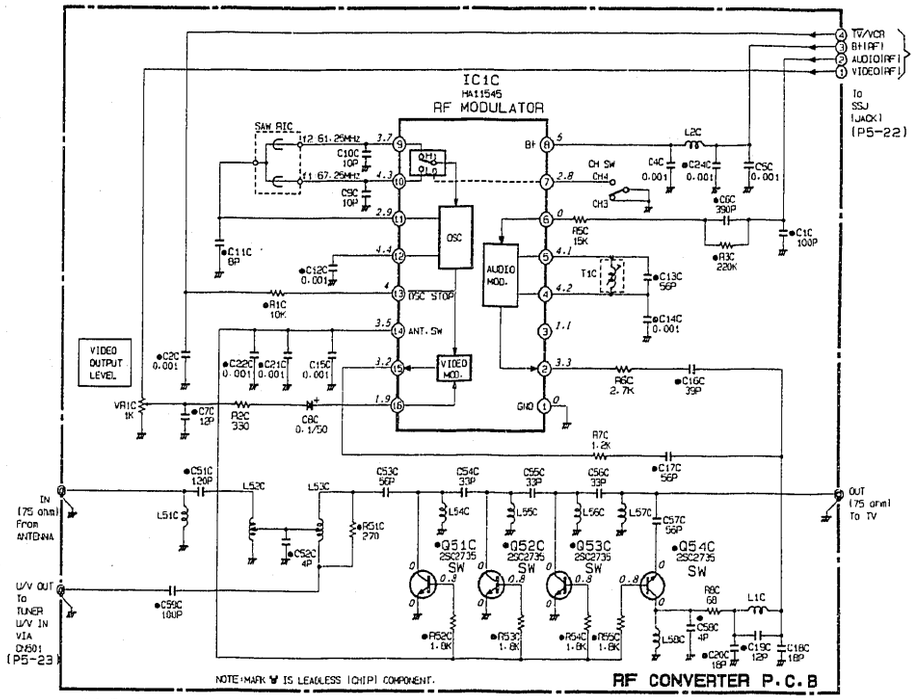


PRE/REC AMP SCHEMATIC DIAGRAM



※ ONE VOLTAGE:PB OR REC MODE
TWO VOLTAGES:PB AND(REC)MODE

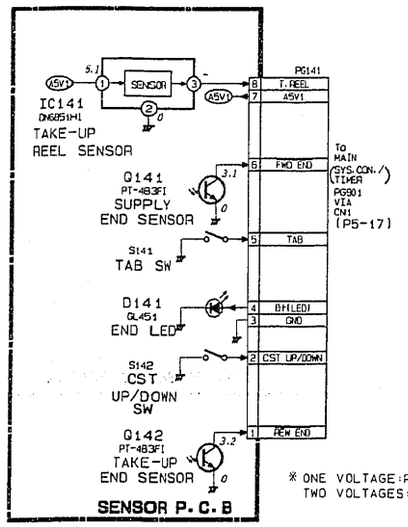
RF CONVERTER SCHEMATIC DIAGRAM



NOTE:MARK ※ IS LEADLESS (CHIP) COMPONENT.

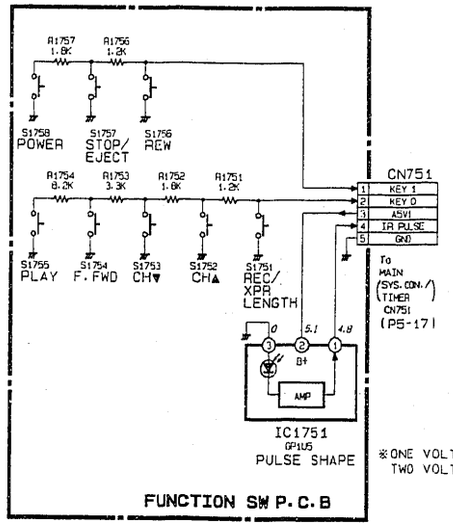
※ ONE VOLTAGE :PB OR REC MODE.
TWO VOLTAGES :PB AND(REC)MODE.

SENSOR SCHEMATIC DIAGRAM



※ ONE VOLTAGE:PB OR REC MODE
TWO VOLTAGES:PB AND(REC)MODE

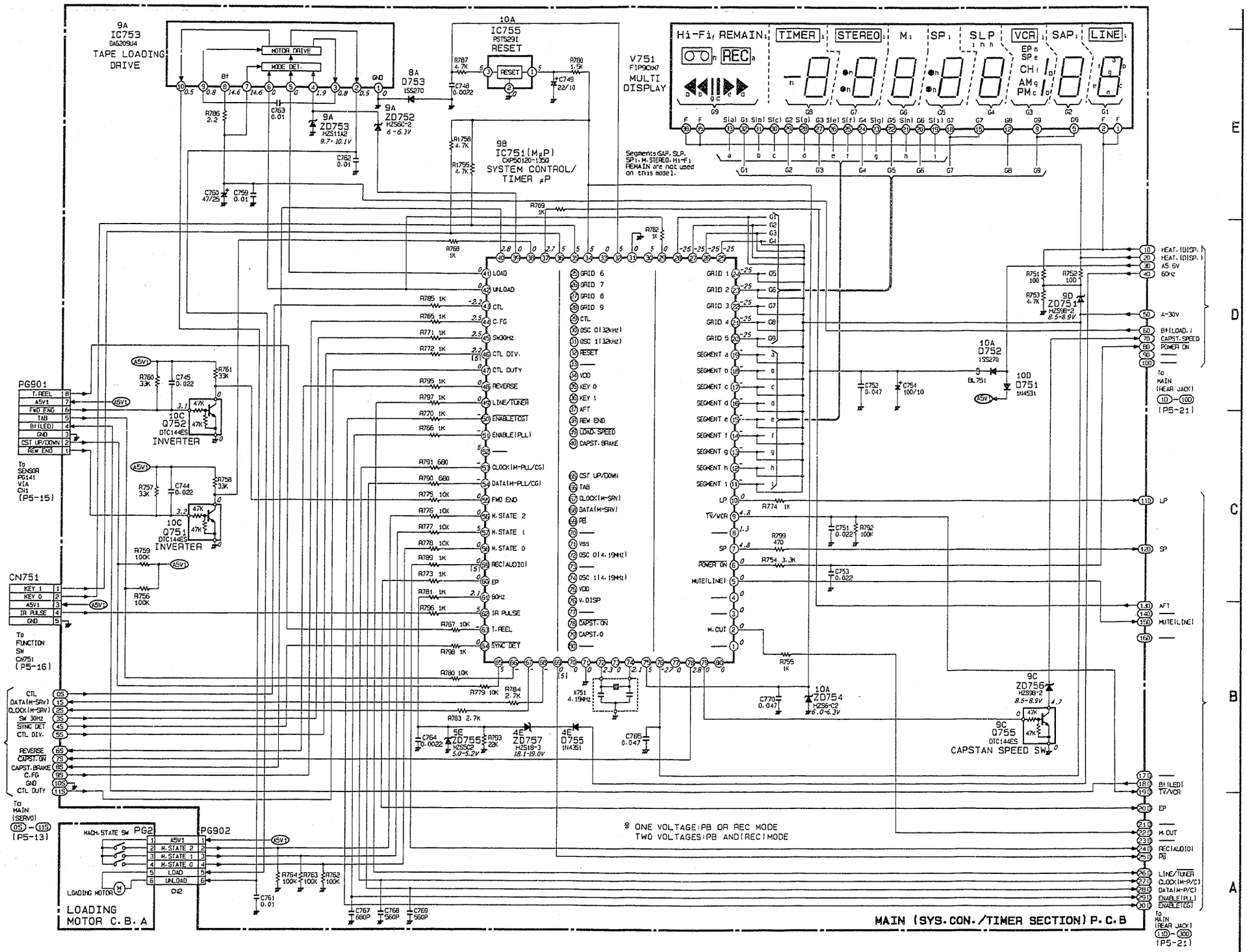
FUNCTION SW SCHEMATIC DIAGRAM



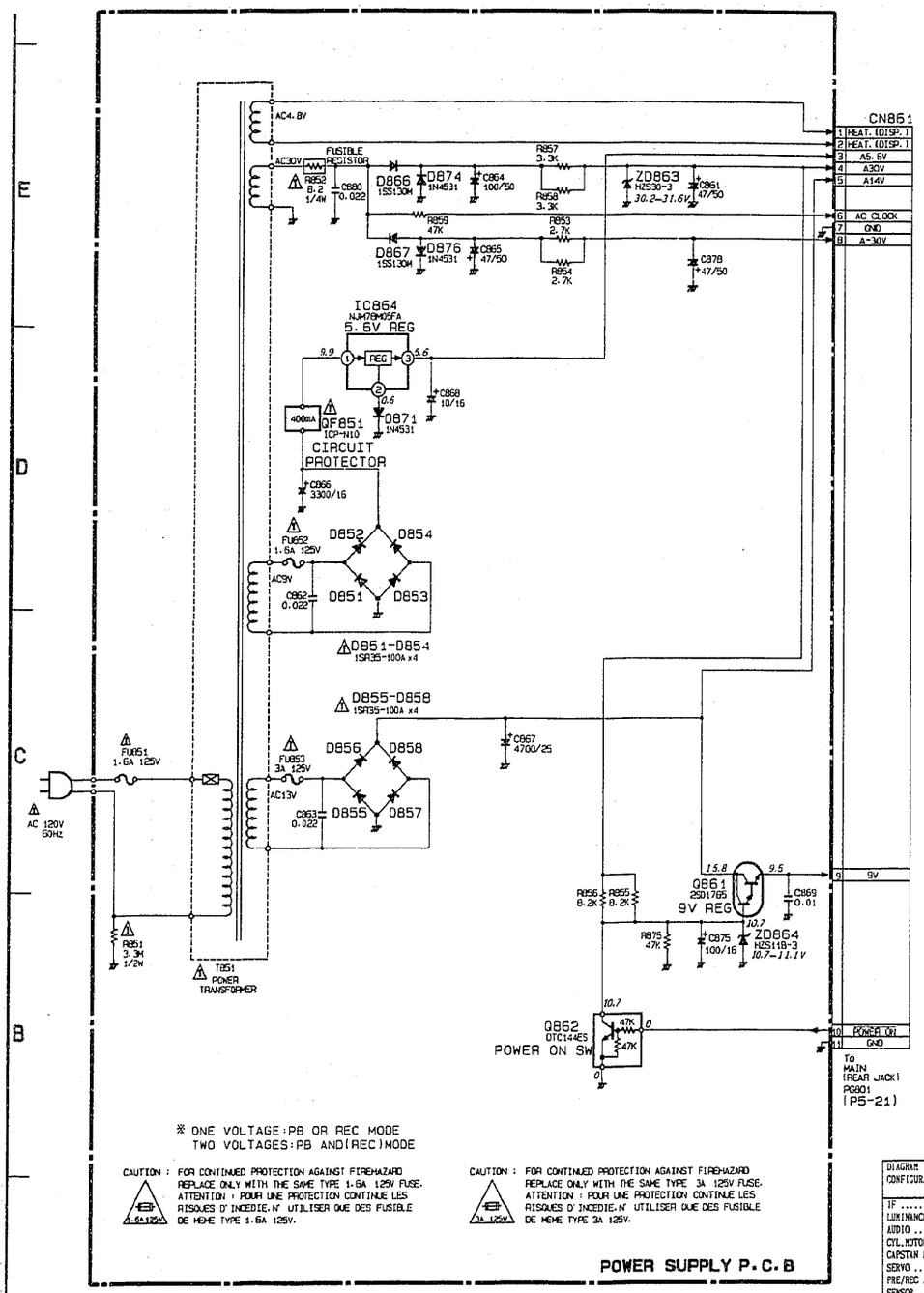
※ ONE VOLTAGE:PB OR REC MODE
TWO VOLTAGES:PB AND(REC)MODE

DIAGRAM CONFIGURATION	SCHEMATIC DIAGRAM	CIRCUIT BOARD DIAGRAM
IF	5-6	-
LUMINANCE/CHROMA	5-7	5-27
AUDIO	5-10	5-25
CYL.MOTOR DRIVE	5-12	5-25
CAPSTAN MOTOR	5-12	-
SERVO	5-13	5-25
PRE/REC AMP	5-15	-
SENSOR	5-15	5-29
RF CONVERTER	5-16	-
FUNCTION SW	5-16	5-26
SYS.CON./TIMER	5-17	5-25
POWER SUPPLY	5-19	5-27
REAR JACK	5-21	5-25
U-V TUNER	5-23	-

SYS. CON. /TIMER SCHEMATIC DIAGRAM



POWER SUPPLY SCHEMATIC DIAGRAM(FOR A)



※ ONE VOLTAGE:PB OR REC MODE
TWO VOLTAGES:PB AND(REC)MODE

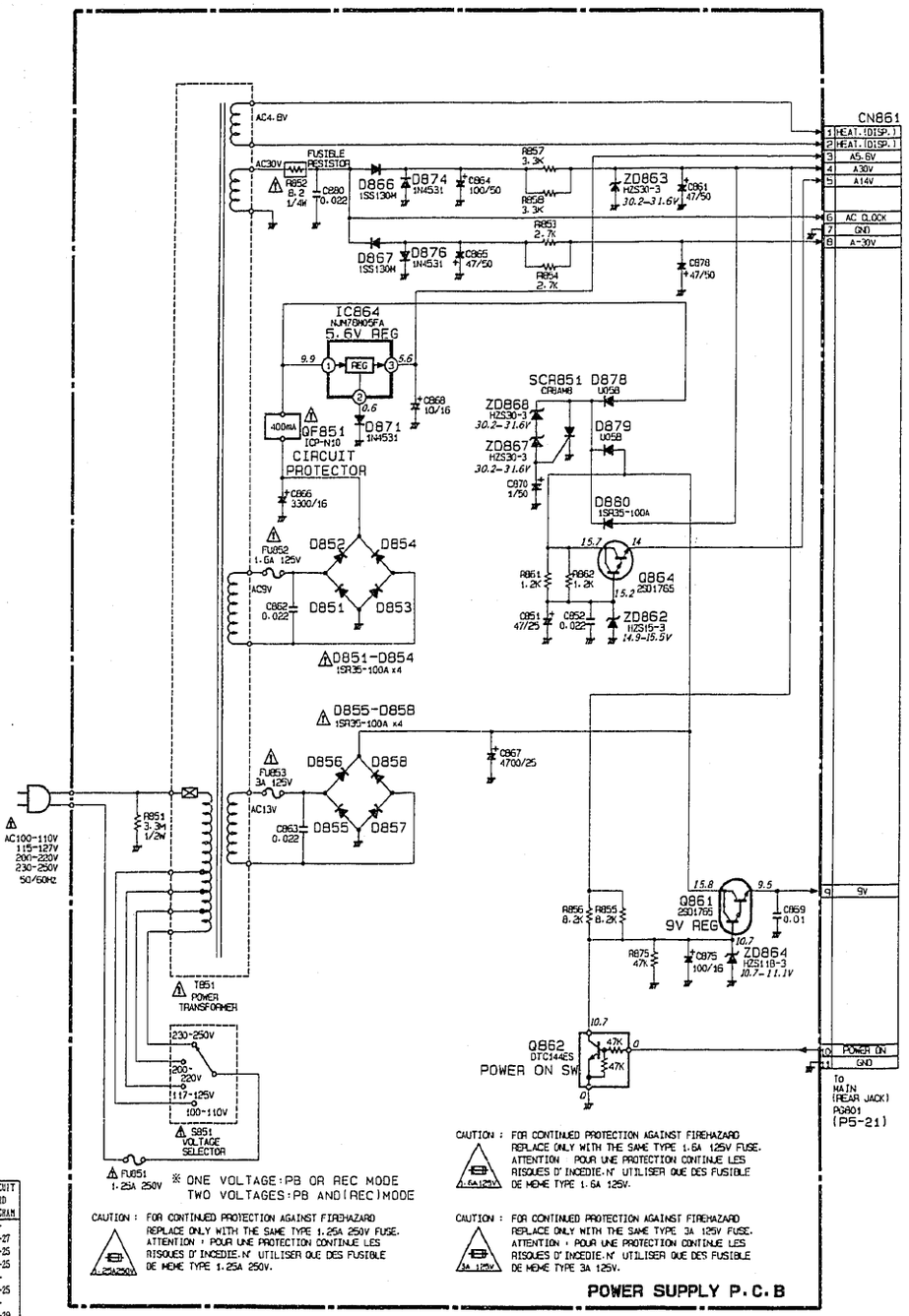
CAUTION : FOR CONTINUED PROTECTION AGAINST FIREHAZARD
REPLACE ONLY WITH THE SAME TYPE 1.6A 125V FUSE.
ATTENTION : POUR UNE PROTECTION CONTINUE LES RISQUES D'INCEDIE.N' UTILISER QUE DES FUSIBLE DE MEME TYPE 1.6A 125V.

CAUTION : FOR CONTINUED PROTECTION AGAINST FIREHAZARD
REPLACE ONLY WITH THE SAME TYPE 3A 125V FUSE.
ATTENTION : POUR UNE PROTECTION CONTINUE LES RISQUES D'INCEDIE.N' UTILISER QUE DES FUSIBLE DE MEME TYPE 3A 125V.

POWER SUPPLY P.C.B

DIAGRAM CONFIGURATION	SCHEMATIC DIAGRAM	CIRCUIT BOARD DIAGRAM
IF	5-6	-
LUMINANCE/CHROMA	5-7	5-27
AUDIO	5-10	5-25
CYL.MOTOR DRIVE	5-12	5-25
CAPSTAN MOTOR	5-12	-
SERVO	5-13	5-25
PRE/REC AMP	5-15	-
SENSOR	5-15	5-29
RF CONVERTER	5-16	-
FUNCTION SW	5-16	5-26
SYS.CON./TIMER	5-17	5-25
POWER SUPPLY	5-19	5-27
REAR JACK	5-21	5-25
U-V TUNER	5-23	-

POWER SUPPLY SCHEMATIC DIAGRAM(FOR AW)



※ ONE VOLTAGE:PB OR REC MODE
TWO VOLTAGES:PB AND(REC)MODE

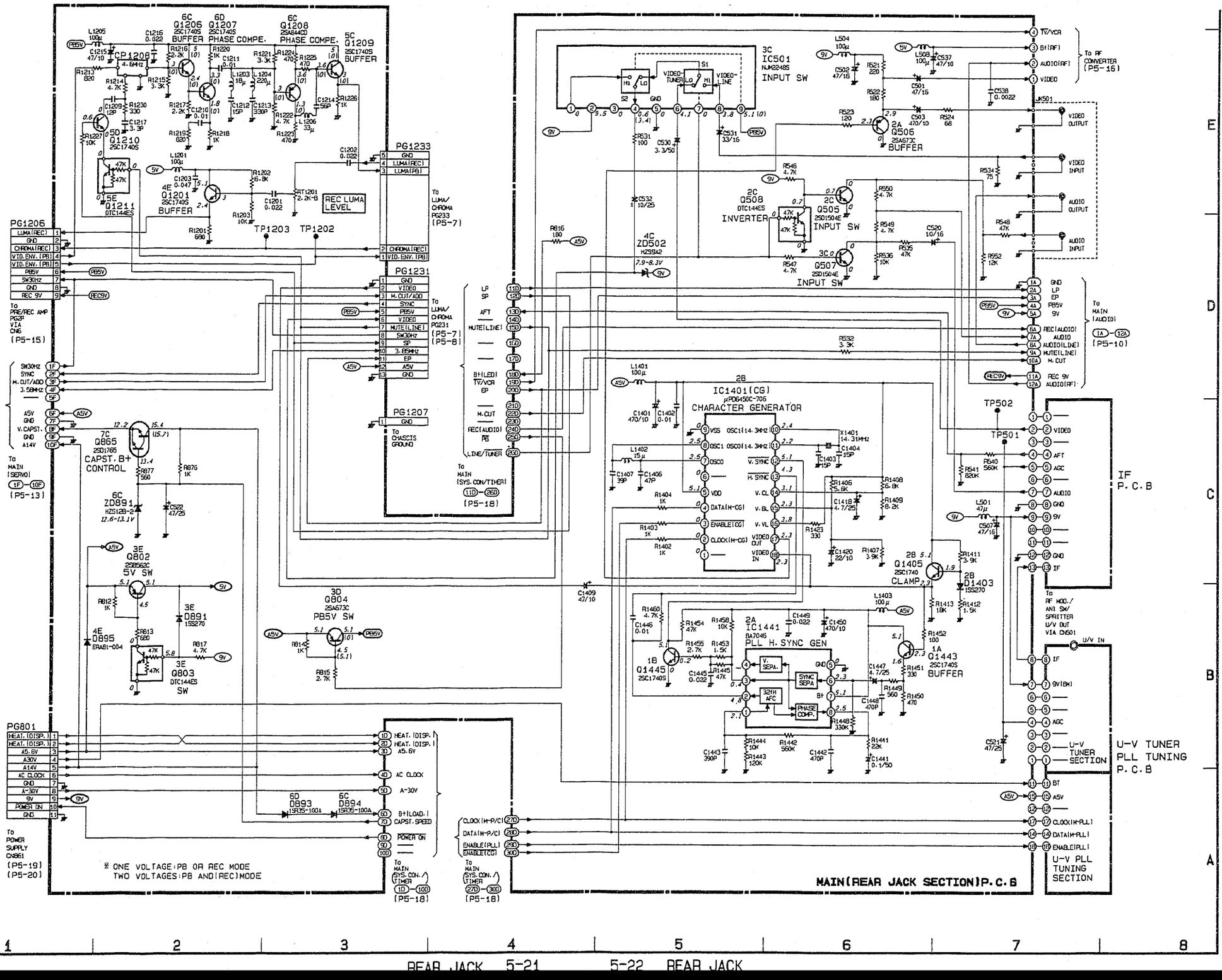
CAUTION : FOR CONTINUED PROTECTION AGAINST FIREHAZARD
REPLACE ONLY WITH THE SAME TYPE 1.25A 250V FUSE.
ATTENTION : POUR UNE PROTECTION CONTINUE LES RISQUES D'INCEDIE.N' UTILISER QUE DES FUSIBLE DE MEME TYPE 1.25A 250V.

CAUTION : FOR CONTINUED PROTECTION AGAINST FIREHAZARD
REPLACE ONLY WITH THE SAME TYPE 1.6A 125V FUSE.
ATTENTION : POUR UNE PROTECTION CONTINUE LES RISQUES D'INCEDIE.N' UTILISER QUE DES FUSIBLE DE MEME TYPE 1.6A 125V.

CAUTION : FOR CONTINUED PROTECTION AGAINST FIREHAZARD
REPLACE ONLY WITH THE SAME TYPE 3A 125V FUSE.
ATTENTION : POUR UNE PROTECTION CONTINUE LES RISQUES D'INCEDIE.N' UTILISER QUE DES FUSIBLE DE MEME TYPE 3A 125V.

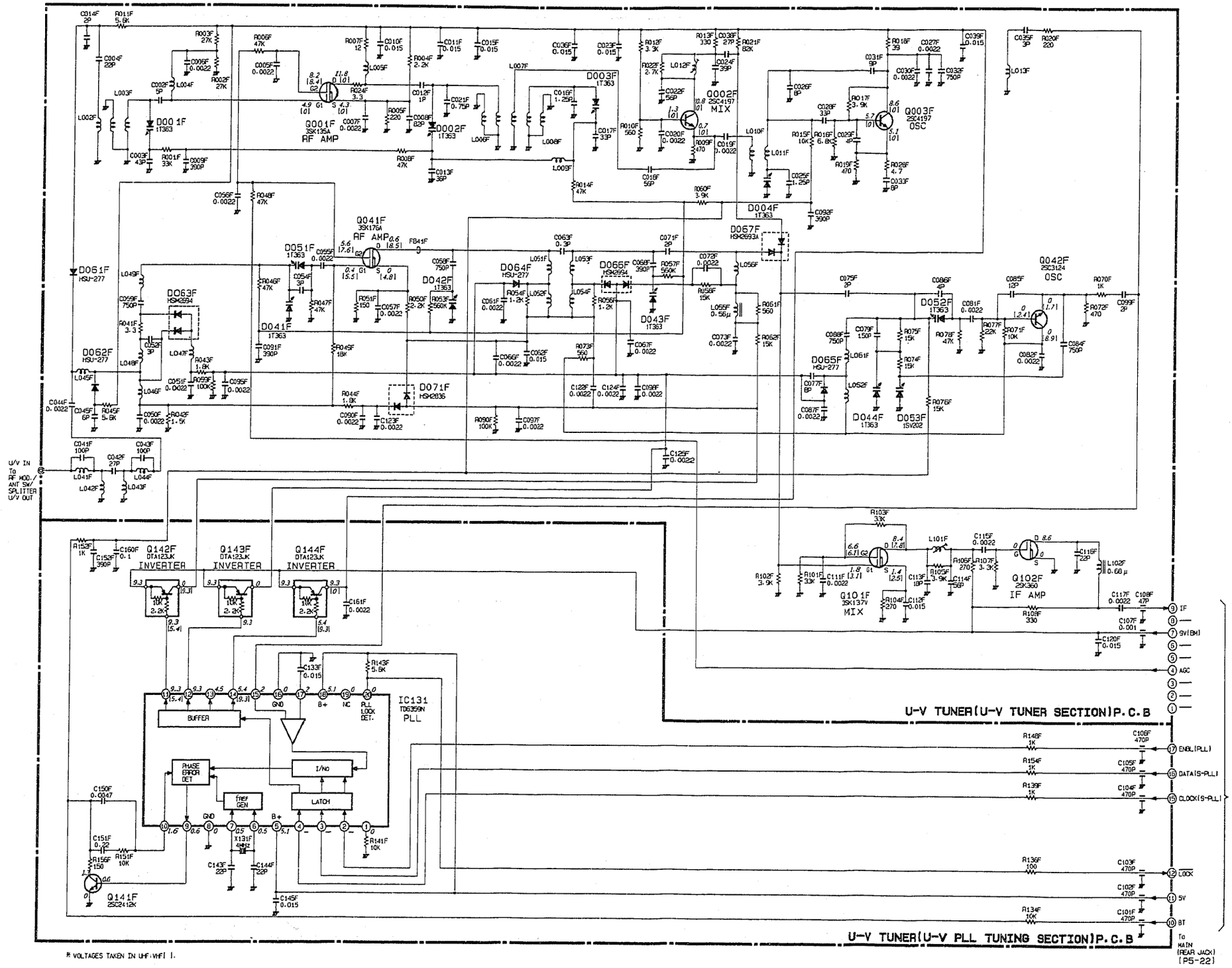
POWER SUPPLY P.C.B

REAR JACK SCHEMATIC DIAGRAM

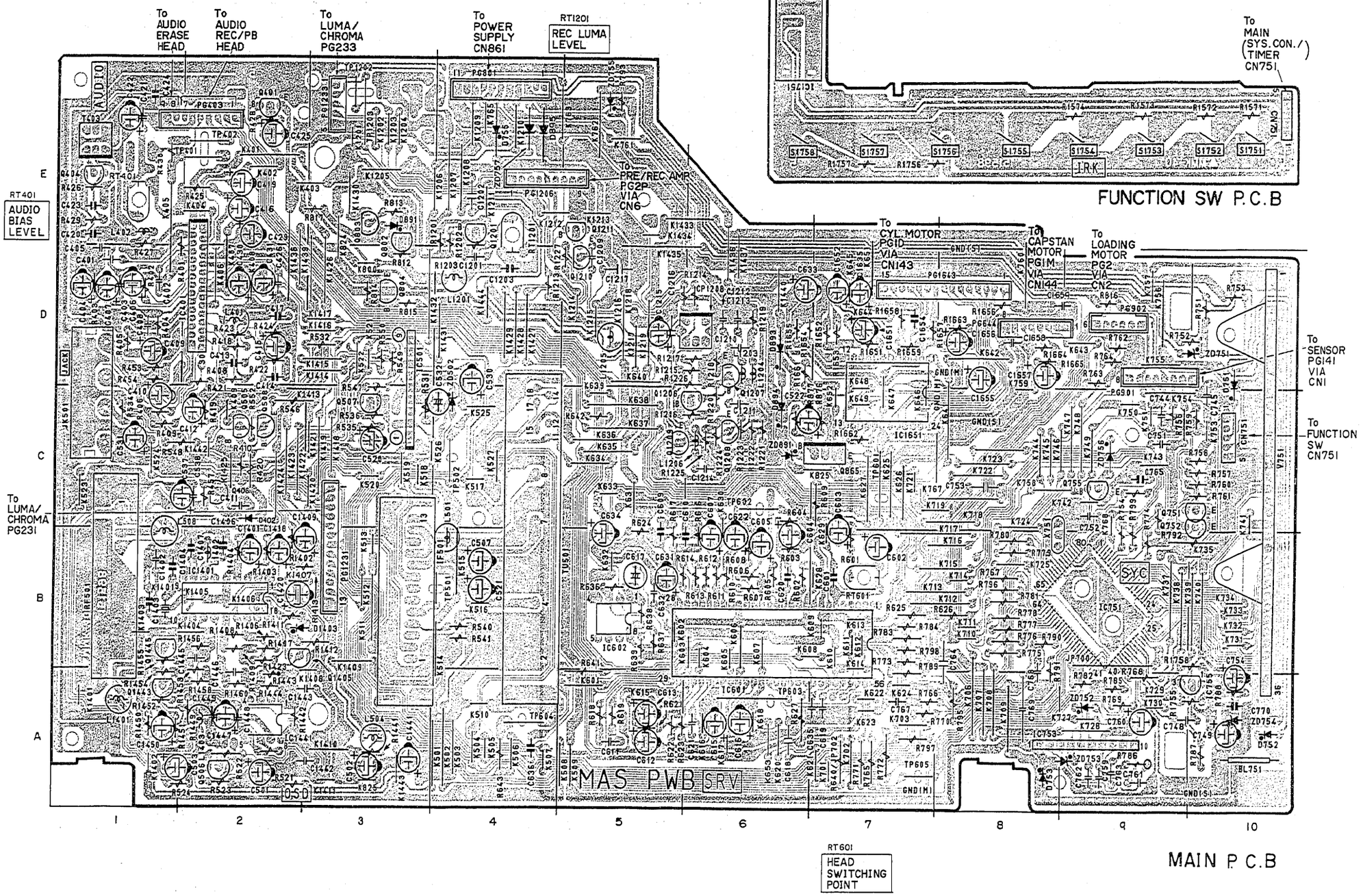


REAR JACK 5-21 5-22 REAR JACK

U-V TUNER SCHEMATIC DIAGRAM

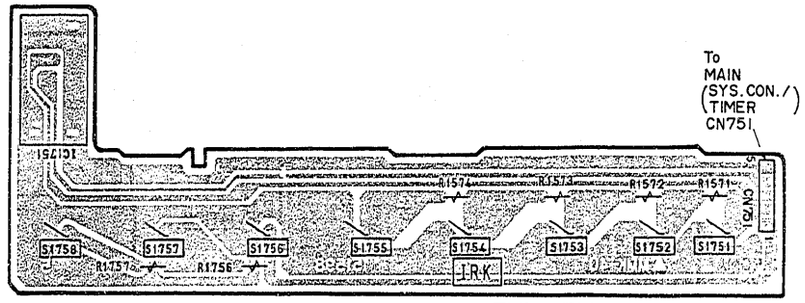


MAIN CIRCUIT BOARD DIAGRAM



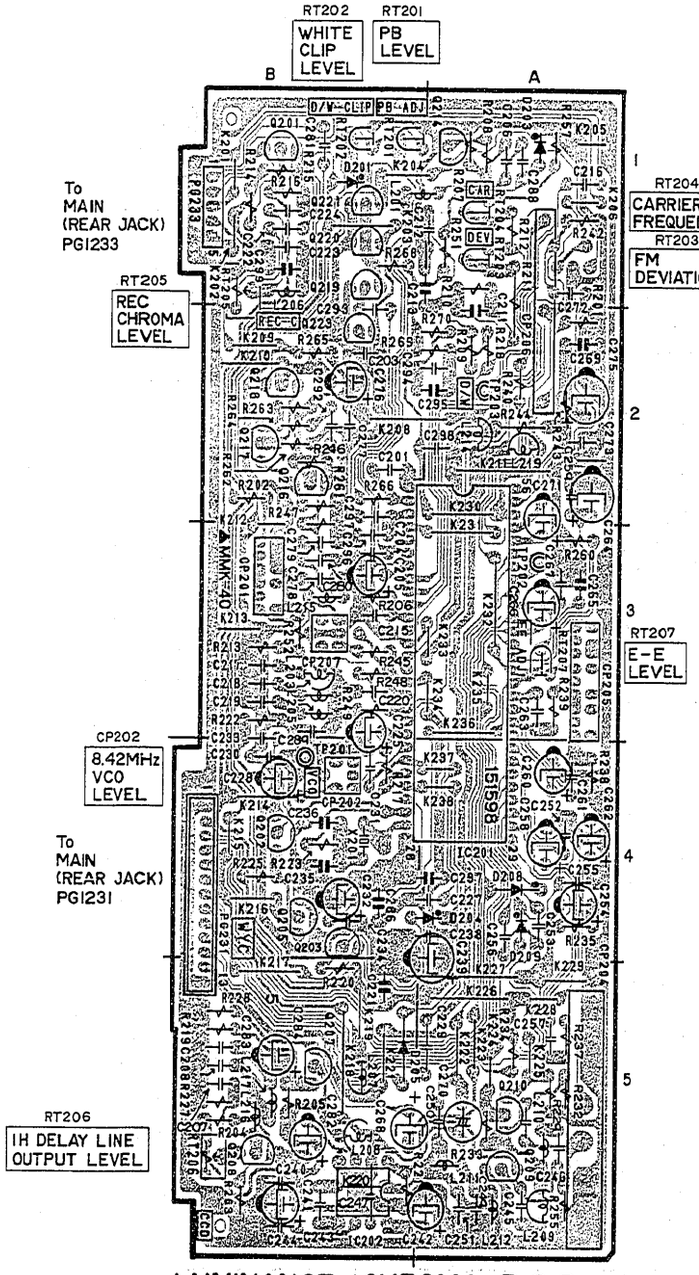
MAIN P.C.B

FUNCTION SW CIRCUIT BOARD DIAGRAM



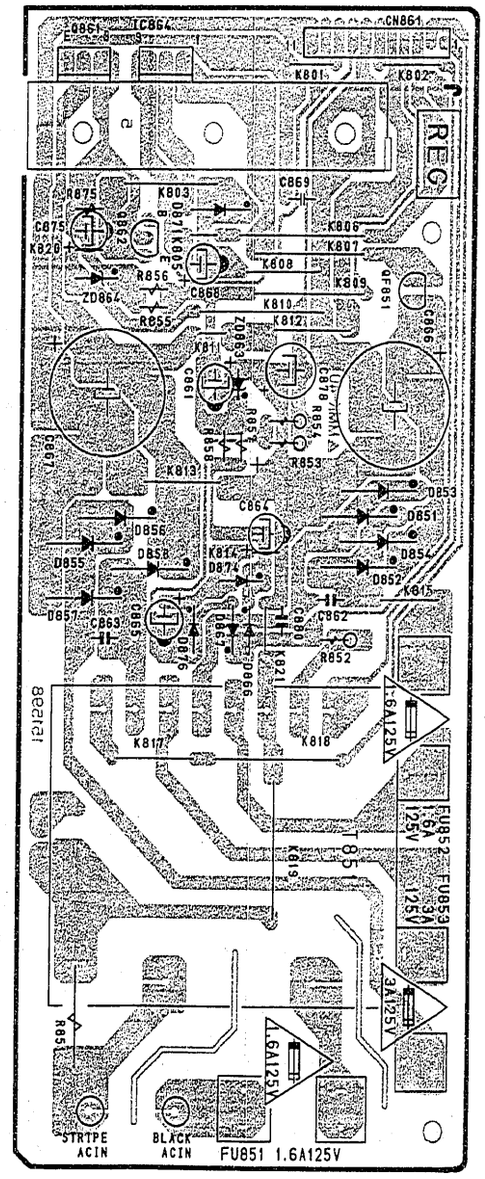
FUNCTION SW P.C.B

LUMINANCE/CHROMA CIRCUIT BOARD DIAGRAM



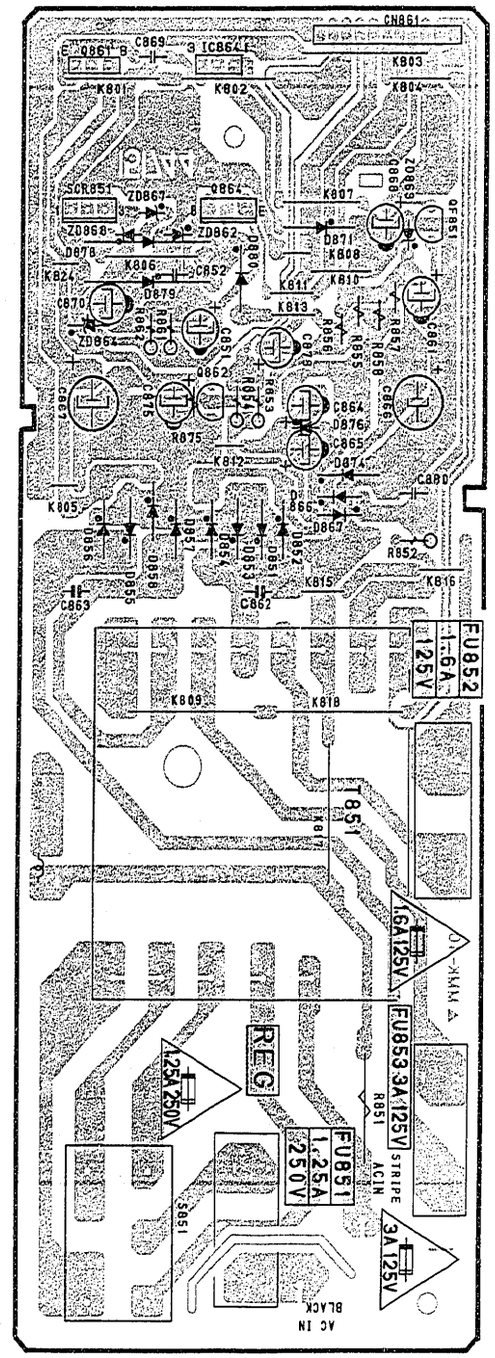
LUMINANCE / CHROMA P.C.B

POWER SUPPLY CIRCUIT BOARD DIAGRAM (FOR A)



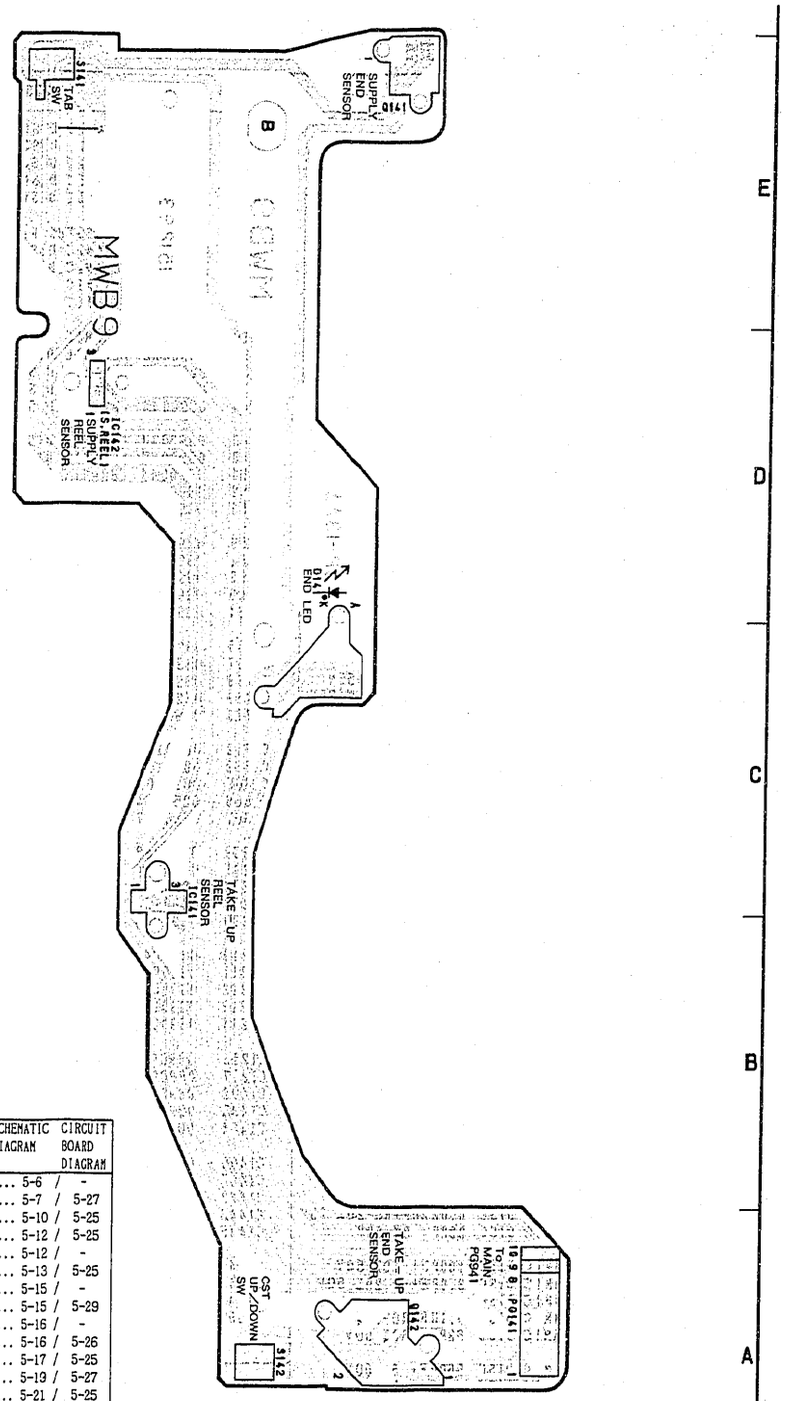
POWER SUPPLY P.C.B (For A)

POWER SUPPLY CIRCUIT BOARD DIAGRAM (FOR AW)



POWER SUPPLY P.C.B (For AW)

SENSOR CIRCUIT BOARD DIAGRAM



SENSOR P.C.B

DIAGRAM CONFIGURATION	SCHEMATIC DIAGRAM	CIRCUIT BOARD DIAGRAM
IF	5-6	-
LUMINANCE/CHROMA	5-7	5-27
AUDIO	5-10	5-25
CYL.MOTOR DRIVE	5-12	5-25
CAPSTAN MOTOR	5-12	-
SERVO	5-13	5-25
PRE/REC AMP	5-15	-
SENSOR	5-15	5-29
RF CONVERTER	5-16	-
FUNCTION SW	5-16	5-26
SYS.CON./TIMER	5-17	5-25
POWER SUPPLY	5-19	5-27
REAR JACK	5-21	5-25
U-V TUNER	5-23	-

REPLACEMENT PARTS LIST
ELECTRICAL PARTS LIST

SYMBOL-No	P-No	DESCRIPTION
		CAPACITORS
C 201	0890019	CERAMIC DISC 68PF+-50% 50V
C 203	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 204	0890035	CERAMIC DISC 1000PF 50V
C 206	0890015	CERAMIC DISC 33PF+-50% 50V
C 207	0890013	CERAMIC DISC 22PF+-5% 50V
C 208	0890021	CERAMIC DISC 82PF+-10% 50V
C 211	0890054	CERAMIC DISC 4PF+-0.25% 50V
C 212	0890015	CERAMIC DISC 33PF+-50% 50V
C 213	0890075	CERAMIC DISC 120PF+-5% 50V
C 215	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 216	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 217	0890046	CERAMIC DISC 0.1UF+80-20% 50V
C 218	0890016	CERAMIC DISC 39PF+-50% 50V
C 219	0890016	CERAMIC DISC 39PF+-50% 50V
C 220	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 222	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 223	0890016	CERAMIC DISC 39PF+-50% 50V
C 224	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 227	0890046	CERAMIC DISC 0.1UF+80-20% 50V
C 229	0890035	CERAMIC DISC 1000PF 50V
C 230	0890035	CERAMIC DISC 1000PF 50V
C 231	0890045	CERAMIC DISC 0.047UF+80-20% 50V
C 233	0890038	CERAMIC DISC 3300PF+-20% 16V
C 234	0890046	CERAMIC DISC 0.1UF+80-20% 50V
C 235	0890121	CERAMIC DISC 33PF+-5% 50V
C 236	0890106	CERAMIC DISC 3.0PF+-0.25% 50V
C 238	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 240	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 243	0890046	CERAMIC DISC 0.1UF+80-20% 50V
C 244	0890035	CERAMIC DISC 1000PF 50V
C 245	0890014	CERAMIC DISC 27PF+-50% 50V
C 246	0890011	CERAMIC DISC 15PF+-5% 50V
C 248	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 249	0890017	CERAMIC DISC 47PF+-5% 50V
C 251	0890017	CERAMIC DISC 47PF+-5% 50V
C 252	0890033	CERAMIC DISC 680PF+-10% 50V
C 253	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 255	0890046	CERAMIC DISC 0.1UF+80-20% 50V
C 256	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 257	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 259	0890045	CERAMIC DISC 0.047UF+80-20% 50V
C 261	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 263	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 267	0890035	CERAMIC DISC 1000PF 50V
C 273	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 277	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 278	0890021	CERAMIC DISC 82PF+-10% 50V
C 279	0890015	CERAMIC DISC 33PF+-50% 50V
C 280	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 281	0890031	CERAMIC DISC 470PF+-10% 50V
C 283	0890013	CERAMIC DISC 22PF+-5% 50V
C 285	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 288	0890013	CERAMIC DISC 22PF+-5% 50V
C 289	0890022	CERAMIC DISC 100PF+-10% 50V
C 290	0890106	CERAMIC DISC 3.0PF+-0.25% 50V
C 292	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 293	0890046	CERAMIC DISC 0.1UF+80-20% 50V
C 294	0890019	CERAMIC DISC 68PF+-50% 50V
C 295	0208526	CERAMIC DISC 560PF+-5% 50V
C 296	0890012	CERAMIC DISC 18PF+-5% 50V
C 297	0890017	CERAMIC DISC 47PF+-5% 50V
C 401	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 402	0890036	CERAMIC DISC 1500PF+-20% 16V
C 403	0890038	CERAMIC DISC 3300PF+-20% 16V
C 405	0890033	CERAMIC DISC 680PF+-10% 50V
C 408	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 411	0890041	CERAMIC DISC 6800PF+-20% 16V
C 421	0890026	CERAMIC DISC 220PF+-10% 50V
C 424	0204271	POLYESTER FILM 8200PF+-5% 100V
C 426	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 538	0890037	CERAMIC DISC 2200PF+-20% 16V
C 611	0890035	CERAMIC DISC 1000PF 50V
C 618	0890035	CERAMIC DISC 1000PF 50V
C 619	0208379	CERAMIC DISC 0.01UF+-30% 16V
C 621	0890022	CERAMIC DISC 100PF+-10% 50V
C 632	0208379	CERAMIC DISC 0.01UF+-30% 16V
C 635	0890024	CERAMIC DISC 150PF+-10% 50V
C 744	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 745	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 748	0890037	CERAMIC DISC 2200PF+-20% 16V
C 751	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 752	0890045	CERAMIC DISC 0.047UF+80-20% 50V
C 753	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 759	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 761	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 762	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 763	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 764	0890037	CERAMIC DISC 2200PF+-20% 16V
C 765	0890102	CERAMIC DISC 0.022UF+80-20% 50V
C 767	0890033	CERAMIC DISC 680PF+-10% 50V
C 768	0890032	CERAMIC 560PF+-10% 50V
C 769	0890032	CERAMIC 560PF+-10% 50V
C 770	0890103	CERAMIC DISC 47000PF+80-20% 12V
C 852	0890102	CERAMIC DISC 0.022UF+80-20% 50V (VT-M161AW)
C 862	0890102	CERAMIC DISC 0.022UF+80-20% 50V
C 863	0890102	CERAMIC DISC 0.022UF+80-20% 50V
C 866	0256864	ELECTROLYTIC 3300UF 16V
C 867	0256787	ELECTROLYTIC 4700UF 25V
C 869	0890043	CERAMIC DISC 0.01UF+-20% 16V
C1201	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C1202	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C1203	0890103	CERAMIC DISC 47000PF+80-20% 12V
C1209	0890009	CERAMIC DISC 12PF+-50% 50V
C1210	0890043	CERAMIC DISC 0.01UF+-20% 16V
C1211	0890043	CERAMIC DISC 0.01UF+-20% 16V
C1212	0890011	CERAMIC DISC 15PF+-5% 50V
C1213	0890028	CERAMIC DISC 330PF+-10% 50V
C1214	0890018	CERAMIC DISC 56PF+-50% 50V
C1216	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C1217	0890004	CERAMIC DISC 3.3PF+-10% 50V
C1402	0890043	CERAMIC DISC 0.01UF+-20% 16V
C1403	0890116	CERAMIC DISC 15PF+-5% 50V
C1404	0890116	CERAMIC DISC 15PF+-5% 50V
C1406	0890123	CERAMIC DISC 47PF+-5% 50V
C1407	0890122	CERAMIC DISC 39PF+-5% 50V
C1442	0890031	CERAMIC DISC 470PF+-10% 50V
C1443	0890029	CERAMIC DISC 390PF+-10% 50V
C1445	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C1446	0890043	CERAMIC DISC 0.01UF+-20% 16V
C1448	0890031	CERAMIC DISC 470PF+-10% 50V
C1449	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C1654	0890102	CERAMIC DISC 0.022UF+80-20% 50V
		RESISTORS
⚠ R 852	0101724	RESISTOR 8.2 OHM 1/4W
RT 201	5007447	SEMI VARIABLE 10KOHM
RT 202	5007435	SEMI VARIABLE 10KOHM
RT 203	5007435	SEMI VARIABLE 10KOHM
RT 204	5007435	SEMI VARIABLE 10KOHM
RT 205	5006235	SEMI VARIABLE 2.2KOHM
RT 206	5006234	SEMI VARIABLE 1KOHM
RT 207	5007435	SEMI VARIABLE 10KOHM
RT 401	5030012	SEMI VARIABLE 220KOHM
RT 601	5030013	SEMI VARIABLE 470KOHM
RT1201	5030005	SEMI VARIABLE 2.2KOHM
RI443	0101736	METAL FILM 120KOHM 1/8W
		SEMI-CONDUCTORS
D 141	5380933	LED GL-451
D 201	5339141	DIODE 1SS270
D 203	5339141	DIODE 1SS270
D 204	5339141	DIODE 1SS270
D 205	5339491	DIODE 1N4531
D 208	5339491	DIODE 1N4531
D 209	5339141	DIODE 1SS270
D 402	5339141	DIODE 1SS270
D 751	5339491	DIODE 1N4531
D 752	5339141	DIODE 1SS270
D 753	5339141	DIODE 1SS270
D 755	5339491	DIODE 1N4531
⚠ D 851	5339231	DIODE 1SR35-100A
⚠ D 852	5339231	DIODE 1SR35-100A
⚠ D 853	5339231	DIODE 1SR35-100A
⚠ D 854	5339231	DIODE 1SR35-100A
⚠ D 855	5339231	DIODE 1SR35-100A
⚠ D 856	5339231	DIODE 1SR35-100A
⚠ D 857	5339231	DIODE 1SR35-100A
⚠ D 858	5339231	DIODE 1SR35-100A
D 866	5339171	DIODE 1SS130M
D 867	5339171	DIODE 1SS130M
D 871	5339491	DIODE 1N4531
D 874	5339491	DIODE 1N4531
D 876	5339491	DIODE 1N4531
D 878	5330501	DIODE HO-5BS1 60HZ 3MW (VT-M161AW)
D 879	5330501	DIODE HO-5BS1 60HZ 3MW (VT-M161AW)
D 880	5339231	DIODE 1SR35-100A (VT-M161AW)
D 891	5339141	DIODE 1SS270
D 893	5339231	DIODE 1SR35-100A
D 894	5339231	DIODE 1SR35-100A
D 895	5339381	DIODE ERA81-004
DI403	5339141	DIODE 1SS270
IC 141	5391282	IC DN6851HI
IC 201	1362232	IC HA118158NT (VT-M161A)
IC 201	1362231	IC HA118157NT (VT-I61AW)
IC 202	1362261	IC CXL5507P
IC 401	1341472	IC LA7297
IC 501	1342031	IC NJM2248S
IC 601	1360391	IC HD49747NT
IC 602	5367221	IC BA6993
IC 751	1355583	IC CXP50120-135Q
IC 753	5300794	IC BA6209M4
IC 755	1341193	IC PST5291
IC 864	1342616	IC NJM78M05FA
IC1401	1361445	IC UPD6450CX-706
IC1441	1361931	IC BA7046
IC1651	1360071	IC BA6459P1
IC1751	1388711	PWB ASSY SBX1644
Q 141	5324661	TRANSISTOR PT-483F1
Q 142	5324661	TRANSISTOR PT-483F1
Q 201	5327063	TRANSISTOR 2SC1740S
Q 202	5327073	TRANSISTOR DTC144ES
Q 203	5327073	TRANSISTOR DTC144ES
Q 205	5327073	TRANSISTOR DTC144ES
Q 207	5327063	TRANSISTOR 2SC1740S
Q 208	5327021	TRANSISTOR 2SA844CD
Q 209	5327073	TRANSISTOR DTC144ES
Q 210	5327063	TRANSISTOR 2SC1740S
Q 214	5327073	TRANSISTOR DTC144ES
Q 216	5327063	TRANSISTOR 2SC1740S
Q 217	5327021	TRANSISTOR 2SA844CD
Q 218	5327021	TRANSISTOR 2SA844CD
Q 219	5327073	TRANSISTOR DTC144ES
Q 220	5327073	TRANSISTOR DTC144ES
Q 221	5327073	TRANSISTOR DTC144ES
Q 223	5327073	TRANSISTOR DTC144ES
Q 401	5327073	TRANSISTOR DTC144ES
Q 404	5327101	TRANSISTOR 2SC3553(B/C)
Q 406	5327091	TRANSISTOR 2SD1504E
Q 505	5327091	TRANSISTOR 2SD1504E
Q 506	5327031	TRANSISTOR 2SA673C
Q 507	5327091	TRANSISTOR 2SD1504E
Q 508	5327073	TRANSISTOR DTC144ES
Q 751	5327073	TRANSISTOR DTC144ES
Q 752	5327073	TRANSISTOR DTC144ES
Q 755	5327073	TRANSISTOR DTC144ES
Q 802	5327131	TRANSISTOR 2SB562C
Q 803	5327073	TRANSISTOR DTC144ES
Q 804	5327031	TRANSISTOR 2SA673C
Q 861	1321341	TRANSISTOR 2SD1765
Q 862	5327073	TRANSISTOR DTC144ES
Q 864	1321341	TRANSISTOR 2SD1765 (VT-M161AW)
Q 865	1321341	TRANSISTOR 2SD1765
Q1201	5327063	TRANSISTOR 2SC1740S
Q1206	5327063	TRANSISTOR 2SC1740S
Q1207	5327063	TRANSISTOR 2SC1740S
Q1208	5327021	TRANSISTOR 2SA844CD
Q1209	5327063	TRANSISTOR 2SC1740S
Q1210	5327063	TRANSISTOR 2SC1740S
Q1211	5327073	TRANSISTOR DTC144ES
Q1405	5327063	TRANSISTOR 2SC1740S
Q1443	5327063	TRANSISTOR 2SC1740S
Q1445	5327063	TRANSISTOR 2SC1740S
⚠ QF 851	5721943	IC PROTECTOR
ZD 502	5339271	ZENER DIODE HZS9A2
ZD 751	5339279	ZENER DIODE HZS9B2
ZD 752	5339262	ZENER DIODE HZS6-C2
ZD 753	5339281	ZENER DIODE HZS11A2
ZD 754	5339262	ZENER DIODE HZS6-C2
ZD 755	5339252	ZENER DIODE HZS5C2
ZD 756	5339279	ZENER DIODE HZS9B2
ZD 757	5339253	ZENER DIODE HZS18-3
ZD 862	5339274	ZENER DIODE HZS15-3 (VT-M161AW)
ZD 863	5339288	ZENER DIODE HZS30-3
ZD 864	5339468	ZENER DIODE HZS11B3
ZD 867	5339288	ZENER DIODE HZS30-3 (VT-M161AW)
ZD 868	5339288	ZENER DIODE HZS30-3 (VT-M161AW)
ZD 891	5339293	ZENER DIODE HZS12B-2
		TRANSFORMERS
T 403	5262545	OSCILLATOR,BIAS
⚠ T 851	5214361	TRANSFORMER,POWER (VT-M161A)
⚠ T 851	5214183	TRANSFORMER,POWER (VT-M161AW)
		COILS
L 201	5159155	CHOKE COIL 120UH+-10%
L 203	5159089	CHOKE COIL 820UH+-10%

SYMBOL-No	P-No	DESCRIPTION
L 204	5159141	CHOKE COIL 10UH
L 205	5159147	CHOKE COIL 33UH
L 206	5159149	CHOKE COIL 47UH
L 207	5159077	CHOKE COIL 100UH+-10%
L 208	5159077	CHOKE COIL 100UH+-10%
L 209	5121184	COIL 100UH
L 210	5159152	CHOKE COIL 68UH
L 211	5159149	CHOKE COIL 47UH
L 212	5159141	CHOKE COIL 10UH
L 214	5159077	CHOKE COIL 100UH+-10%
L 215	5159144	CHOKE COIL 18UH
L 216	5159152	CHOKE COIL 68UH
L 217	5159152	CHOKE COIL 68UH
L 219	5159077	CHOKE COIL 100UH+-10%
L 401	5159114	CHOKE COIL 15MH
L 402	5159143	CHOKE COIL 220UH
L 501	5159073	CHOKE COIL 47UH+-10%
L 504	5159077	CHOKE COIL 100UH+-10%
L 508	5159077	CHOKE COIL 100UH+-10%
L1201	5159077	CHOKE COIL 100UH+-10%
L1203	5159144	CHOKE COIL 18UH
L1204	5159153	CHOKE COIL 220UH
L1205	5159077	CHOKE COIL 100UH+-10%
L1206	5159147	CHOKE COIL 33UH
L1401	5159077	CHOKE COIL 100UH+-10%
L1402	5159143	CHOKE COIL 15UH
L1403	5159077	CHOKE COIL 100UH+-10%
		CRYSTALS
X 201	5781901	CRYSTAL
X 751	5778071	CRYSTAL
X1401	5778311	CRYSTAL
		MISCELLANEOUS
BL 751	5272376	FILTER
CP 201	5165271	LOW PASS FILTER
CP 202	5165095	FILTER,BAND PASS
CP 204	5786331	DELAY LINE
CP 205	5163574	FILTER,BAND PASS
CP 206	5165053	LC FILTER
CP 207	5165281	HIGHT PASS FILTER
⚠ FU 851	5722651	FUSE 1.6A(VT-M161A)
⚠ FU 851	5721479	FUSE 1.25A(VT-M161AW)
⚠ FU 852	5722651	FUSE 1.6A
⚠ FU 853	5721408	FUSE 3A
IF 501	5583825	PWB ASSY DEMODULATOR
JK 501	5696032	JACK
RF 501	5589241	PWB ASSY RF MOD/ANT SW/SPLIT
S 141	5635321	SWITCH
S 142	5635331	SWITCH
⚠ S 851	5605341	SWITCH (VT-M161AW)
S1751	5634884	SWITCH
S1752	5634884	SWITCH
S1753	5634884	SWITCH
S1754	5634884	SWITCH
S1755	5634884	SWITCH
S1756	5634884	SWITCH
S1757	5634884	SWITCH
S1758	5634884	SWITCH
SCR851	5390191	THYRISTOR CR8AM (VT-M161AW)
TU 501	5582161	PWB ASSY UHF-VHF TUNER
V 751	5315321	FLUORESCENT INDICATOR TUBE

MECHANICAL PARTS LIST

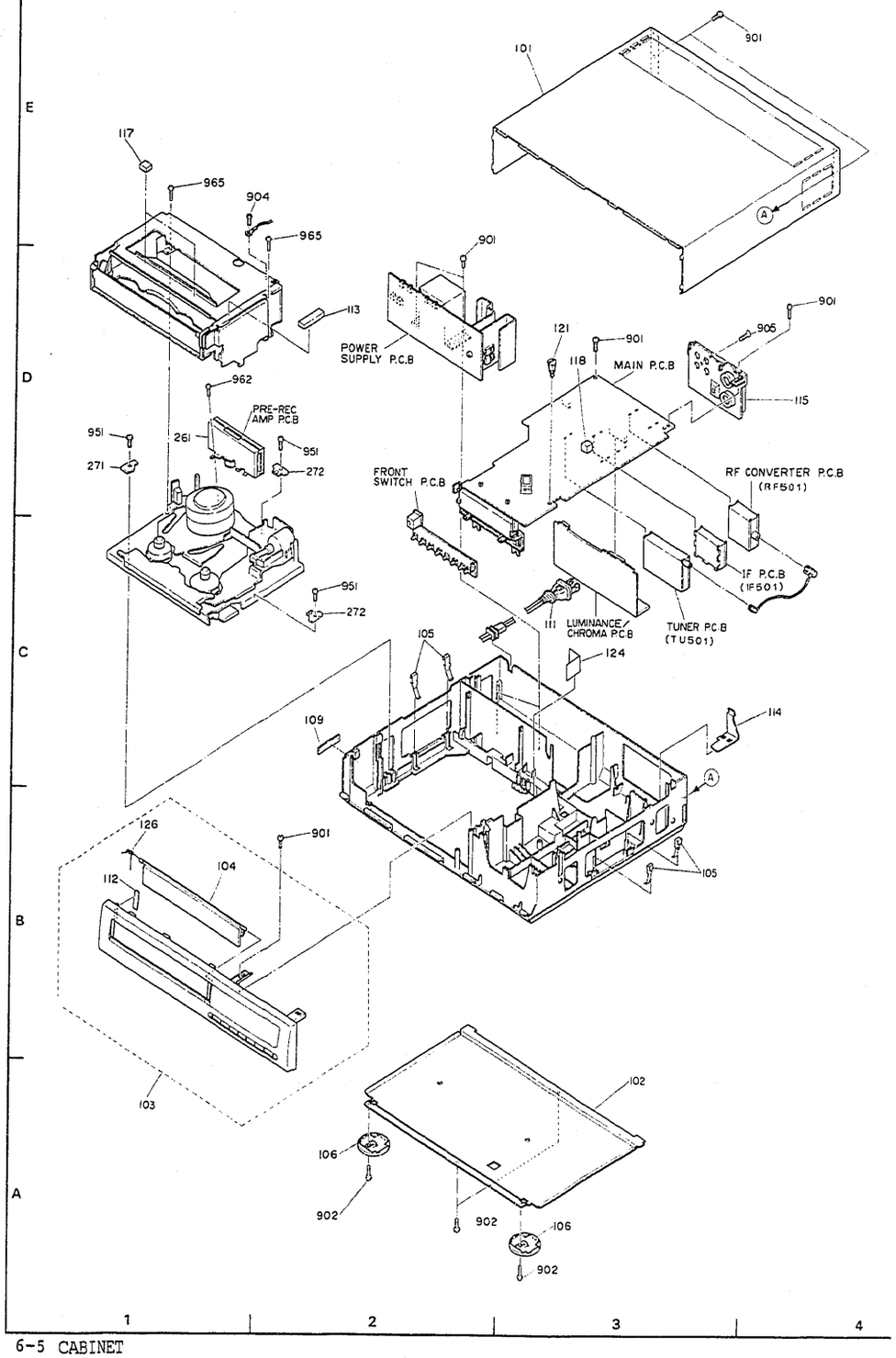
SYMBOL-No	P-No	DESCRIPTION
		FOR FINAL ASSEMBLY
101	6009661	COVER,TOP
102	6006933	COVER,BOTTOM
103	4722043	PANEL,FRONT
104	4723341	DOOR,CASSETTE
105	6527686	PLATE
106	6442472	INSULATOR
109	7674013	CUSHION
⚠ 111	5850753	CORD,POWER
112	6812091	DOOR,STOPPER
113	4330231	FILT
114	6528141	PLATE
115	6485197	PANEL,REAR
117	6562611	CUSHION,RUBBER
118	6562614	CUSHION,RUBBER
121	6802271	BRACKET
124	7703224	SPACER
126	6552334	SPRING
202	6915922	SCREW
203	7469871	BASE
204	5434061	HEAD,AC
205	6304906	SPRING
206	6522752	SPRING
207	7785673	NUT
208	6820341	ARM
209	6555501	SPRING
210	6416121	REEL TABLE,SUPPLY
211	7789123	POLYSLIDER WASHER
212	6416131	REEL TABLE,TAKE UP
213	7789122	POLYSLIDER WASHER
214	6975766	ARM,PRESSER ROLLER
215	6804273	BLOCK,SLIDER
216	7412822	PLATE
217	7429651	GEAR,LOADING(L)
218	7429661	GEAR,LOADING(R)
219	6911551	GUIDE ROLLER BASE(IN)
220	6424261	ROLLER,GUIDE
221	6911573	GUIDE ROLLER BASE(OUT)
222	6897071	BASE,CYL
223	5445851	HEAD FULL ERASE
225	4508237	GUIDE,TAPE
226	6555431	SPRING
227	7413665	HOLDER-BAND
228	7412863	ARM
229	6555446	SPRING
230	6897265	BRACKET
231	6896752	ARM
232	6555061	SPRING
233	6820351	ARM

SYMBOL-No	P-No	DESCRIPTION
235	7468856	LOADING BLOCK
236	7398631	BRACKET
237	7412881	ARM
238	6976551	ARM
239	7412893	ARM
240	7428072	ARM OPERATION
241	6896903	BRAKE
242	6551153	SPRING
243	6804792	BRAKE
244	6896895	HOLDER,MOTOR
245	6896852	ARM
246	6897251	ARM
247	6555483	SPRING
248	6897271	ARM
249	6897066	GEAR,MODE
250	6434861	WORM WHEEL
251	6555052	SPRING
252	7799012	WASHER
253	6976372	ARM
255	4508235	GUIDE
258	7786623	POLYSLIDER WASHER
259	6898472	ARM,IDLE
261	4133342	PWB ASSY PRE AMP
268	7472092	BRACKET
271	7429631	BRACKET
272	7429641	BRACKET
273	7472125	ARM
275	7788348	WASHER
301	5571741	MOTOR,CAPSTAN
302	6804834	BASE
303	6351555	BELT
304	6897095	ARM,FF/REW
305	6434852	RACK
402	6804982	BRACKET
403	6804962	BRACKET
404	6896971	WORM WHEEL ASSY
405	6435571	WORM
406	4508221	WORM SHAFT
407	6804992	BRACKET
408	6896632	ARM-SWITCH
409	6302474	SPRING
410	6897041	ARM-SWITCH
411	7412583	BRACKET-GEAR
412	7449178	HOLDER
413	7449164	BASE,CASSETTE HOLDER
414	6896664	HOLDER,CASSETTE (R)
415	7428113	HOLDER,STAY
416	6820361	ARM
417	6897001	ARM
418	6556241	SPRING

YMBOL-No	P-No	DESCRIPTION
419	6896673	HOLDER,CASSETTE (L)
420	7412944	ARM
421	6555772	SPRING
422	7412953	SPRING
423	6806531	HOLDER,FRONT
424	7580791	SHAFT ASSY
425	7412552	BRACKET
426	7794391	WASHER
501	5457962	UPPER CYLINDER (CY-Z2N)
502	5436317	CYLINDER,LOWER(CY-Z2NC-L)
503	5792635	BRUSH,CYLINDER
901	8699410	SCREW(3X10)
902	8699412	SCREW (3X12) BLACK
904	8691406	3X6 BT BIND SCREW
905	7781582	FALT SCREW-3MMDX10MM (BLACK)
951	8691410	SCREW
952	8691308	SCREW BT2.6MMDX8MM
953	8699408	SCREW
954	7781872	SCREW-3MMDX8MM
955	7773086	SCREW
956	8741414	SCREW (3X14)
957	8691412	SCREW (3X12)
958	8691408	SCREW (3X8)
959	8711406	SCREW - 3X6 PAN HEAD SCREW
960	8741412	SCREW (B3X12)
961	7785941	SCREW
962	8711404	SCREW - 3X4 PAN HEAD SCREW
963	7775581	SCREW(M3X14)
965	8741408	SCREW (B3X8)
998	7784131	SCREW(3X8)
999	8711405	SCREW(3X5)

FOR ACCESSARIES	
5614898	REMOTE HAND SET
5857952	VCR COAXIAL RF CABLE
5662611	SIEMENS PLUG

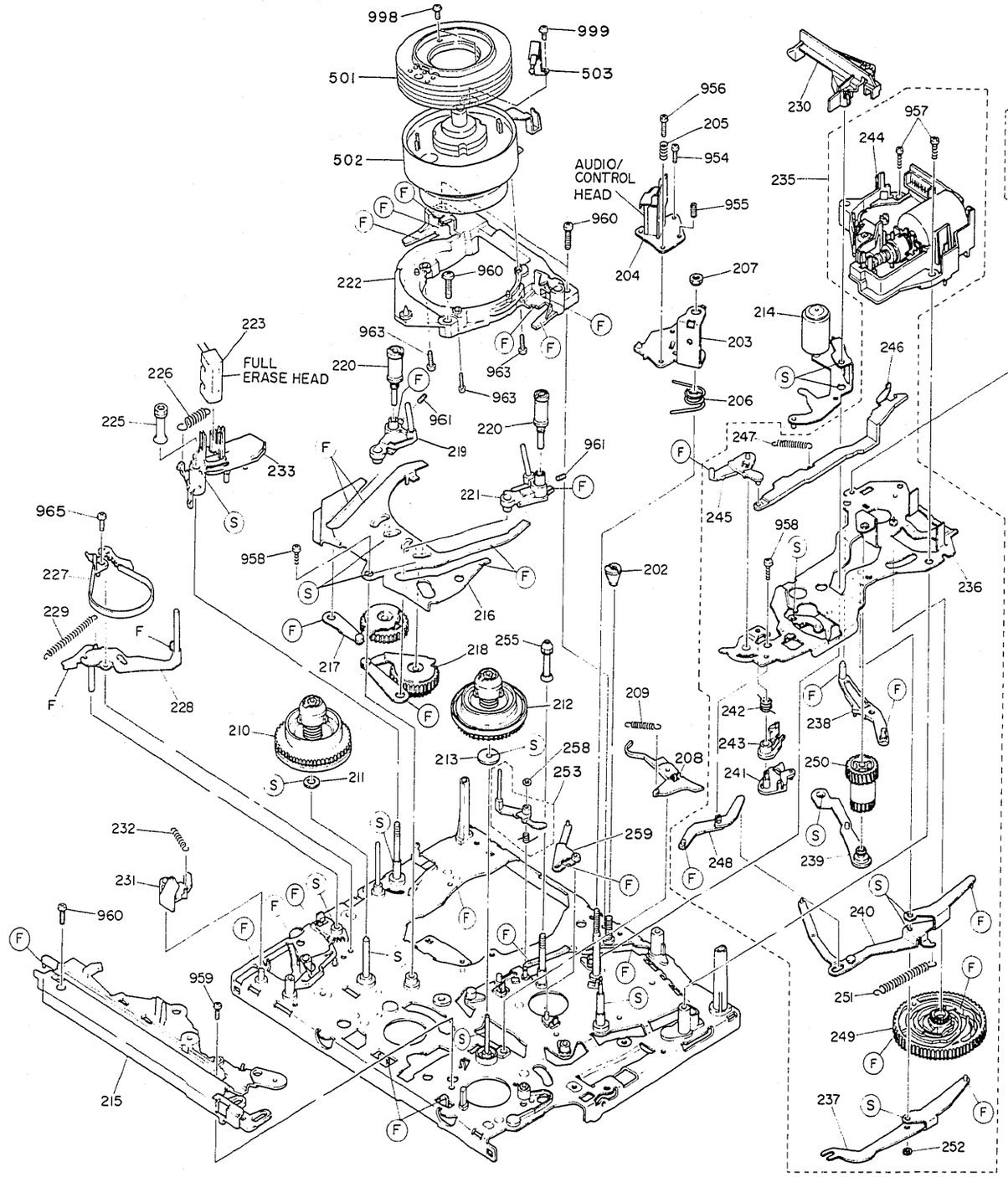
EXPLODED VIEWS
CABINET SECTION

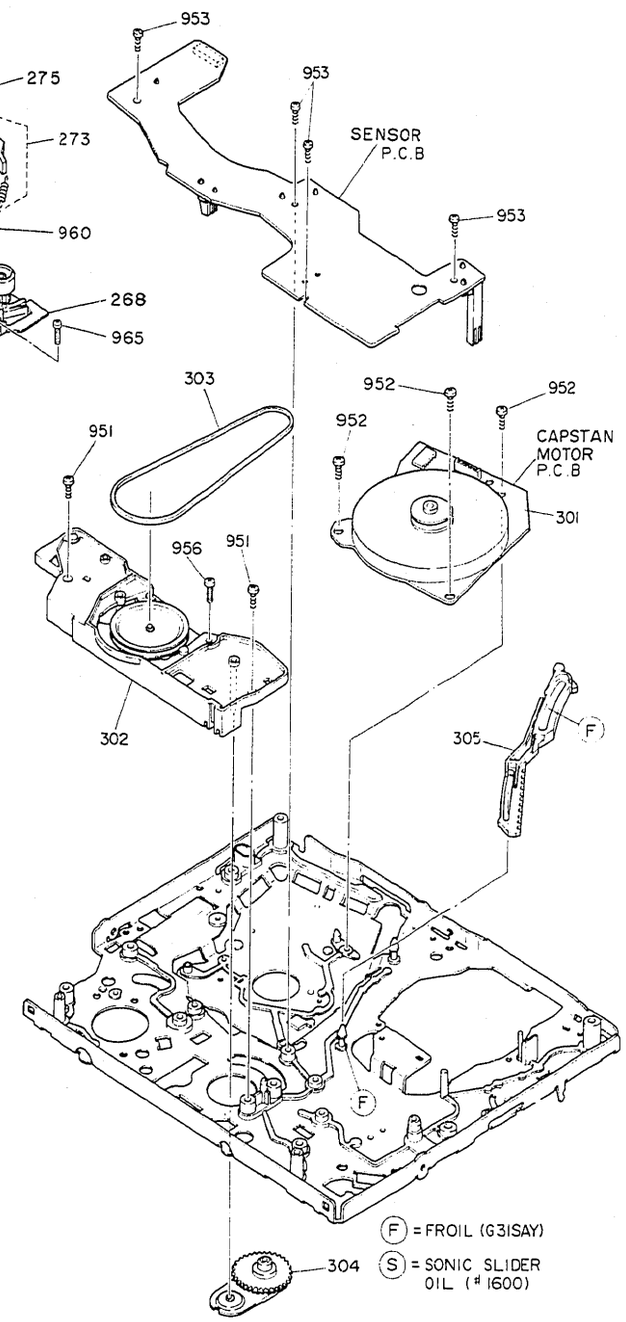


6-5 CABINET

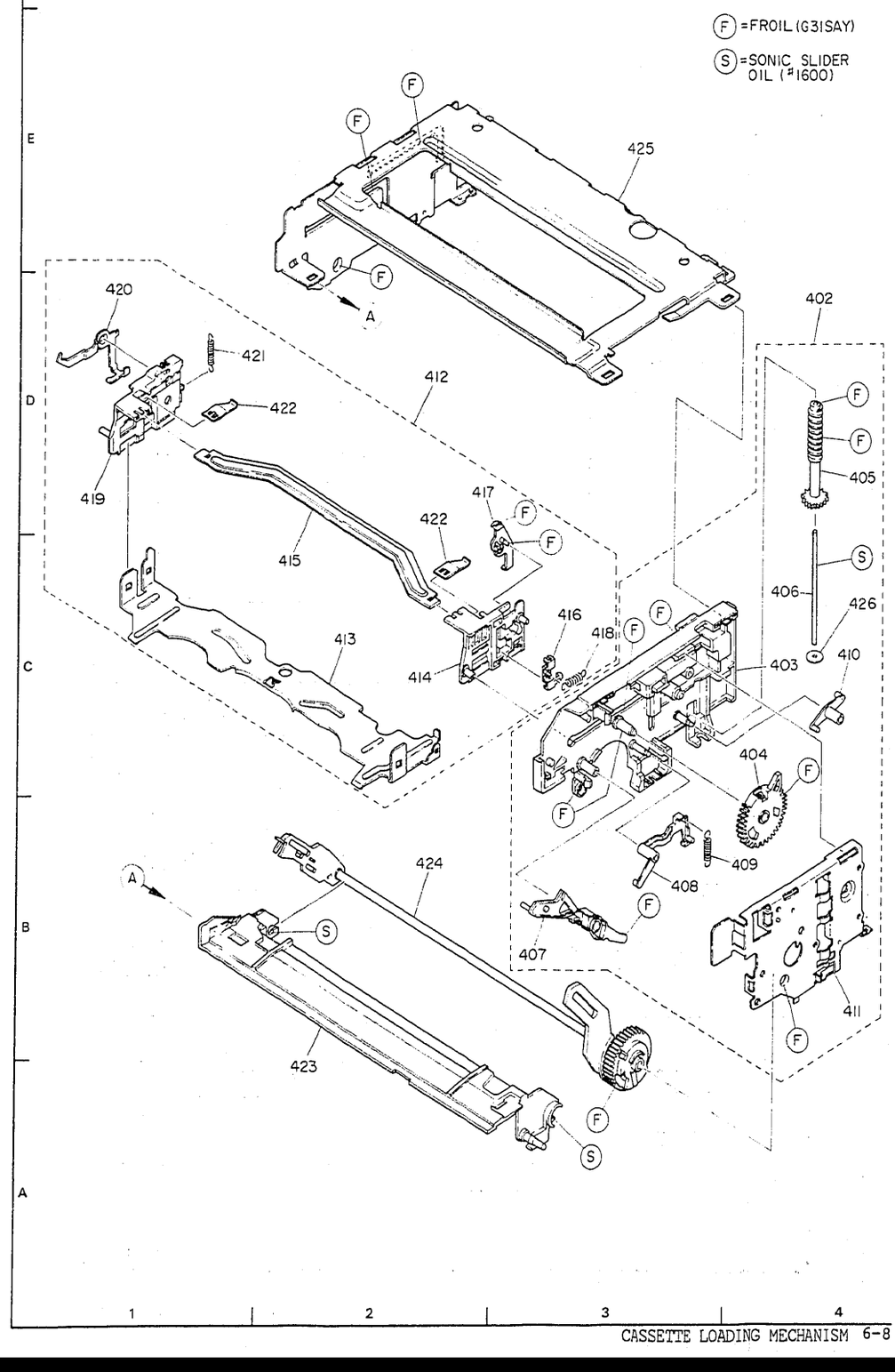
CHASSIS (I) SECTION

CHASSIS (II) SECTION



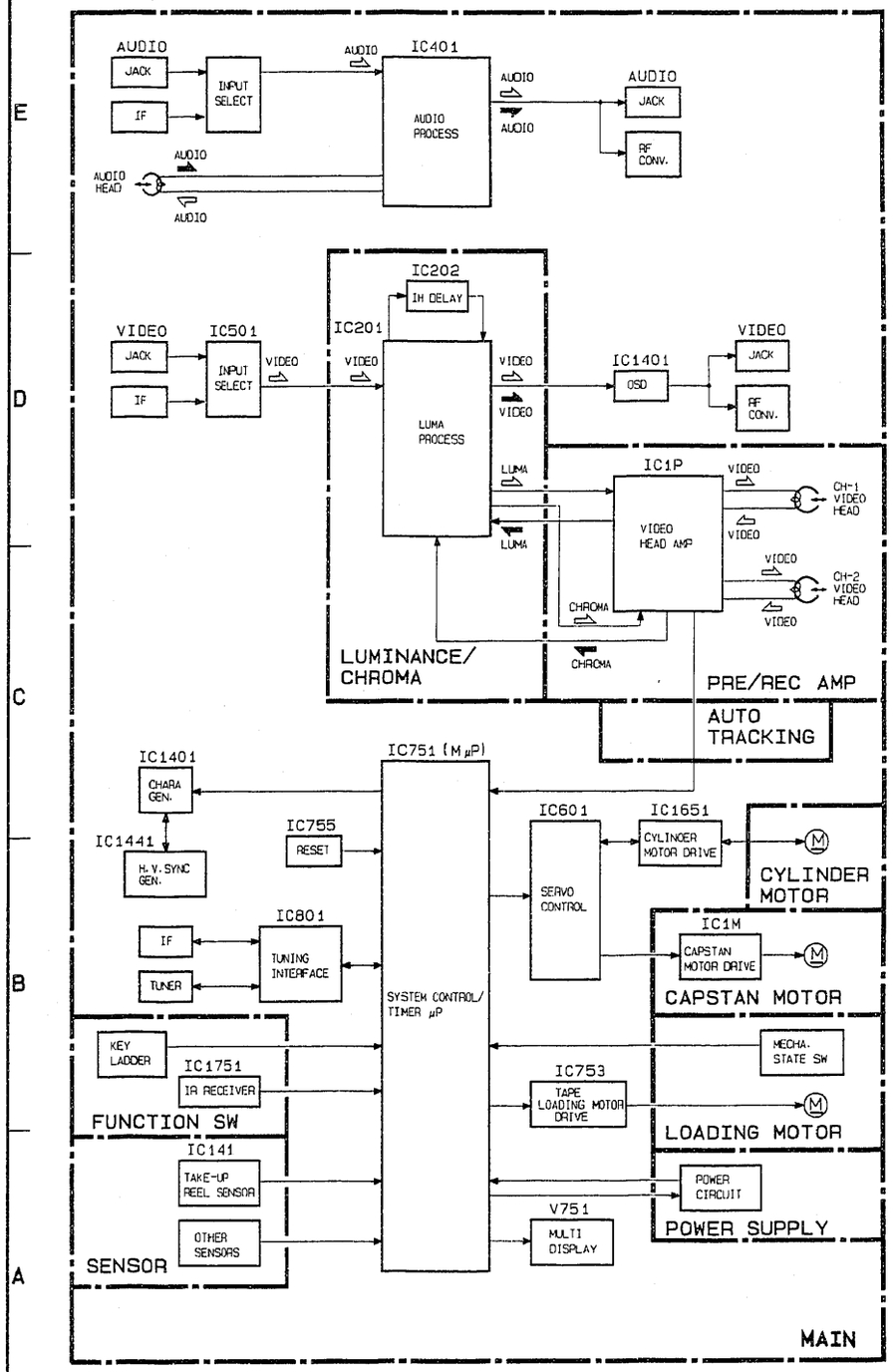


CASSETTE LOADING MECHANISM SECTION



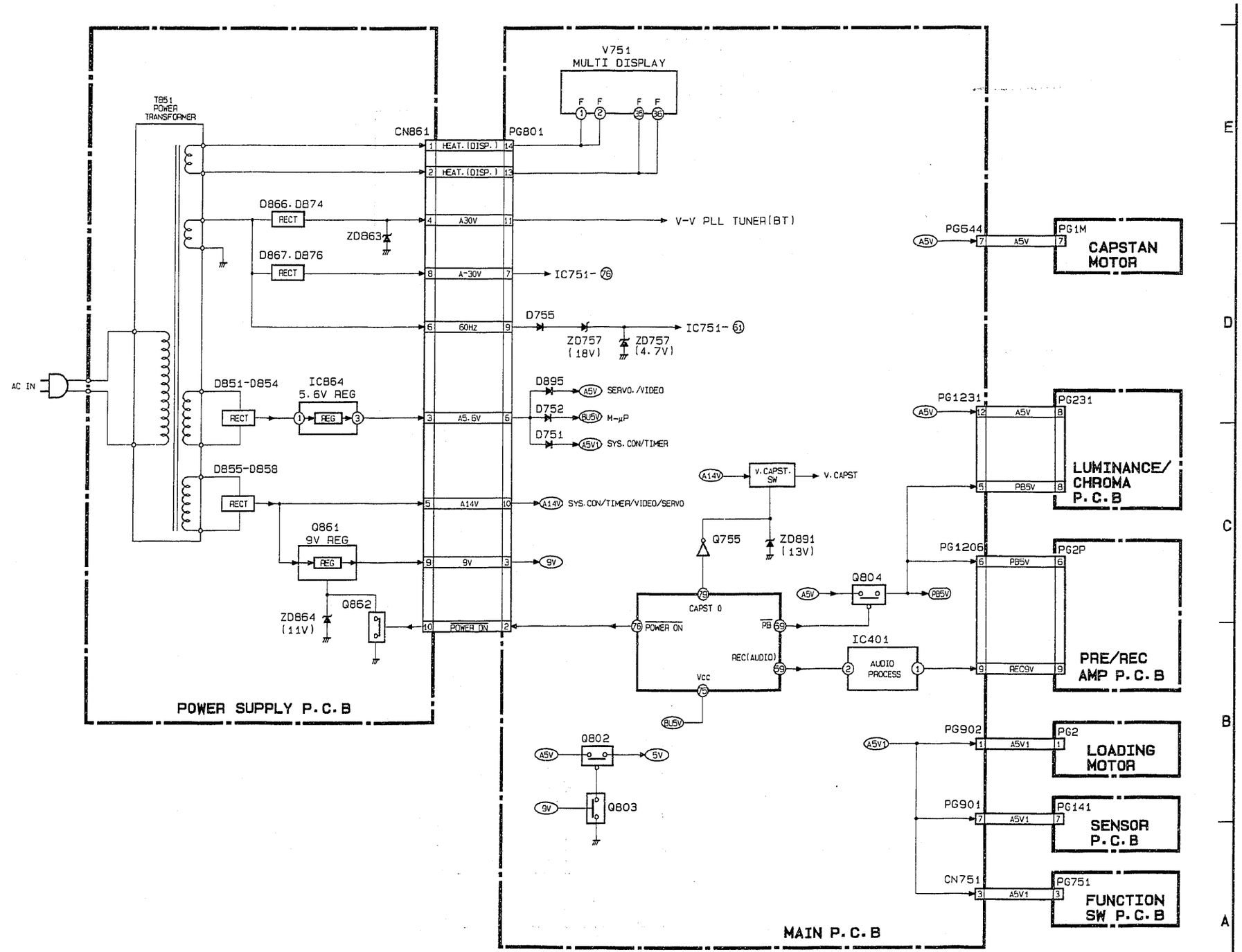
CHAPTER 7 BLOCK DIAGRAM

1. OVERALL

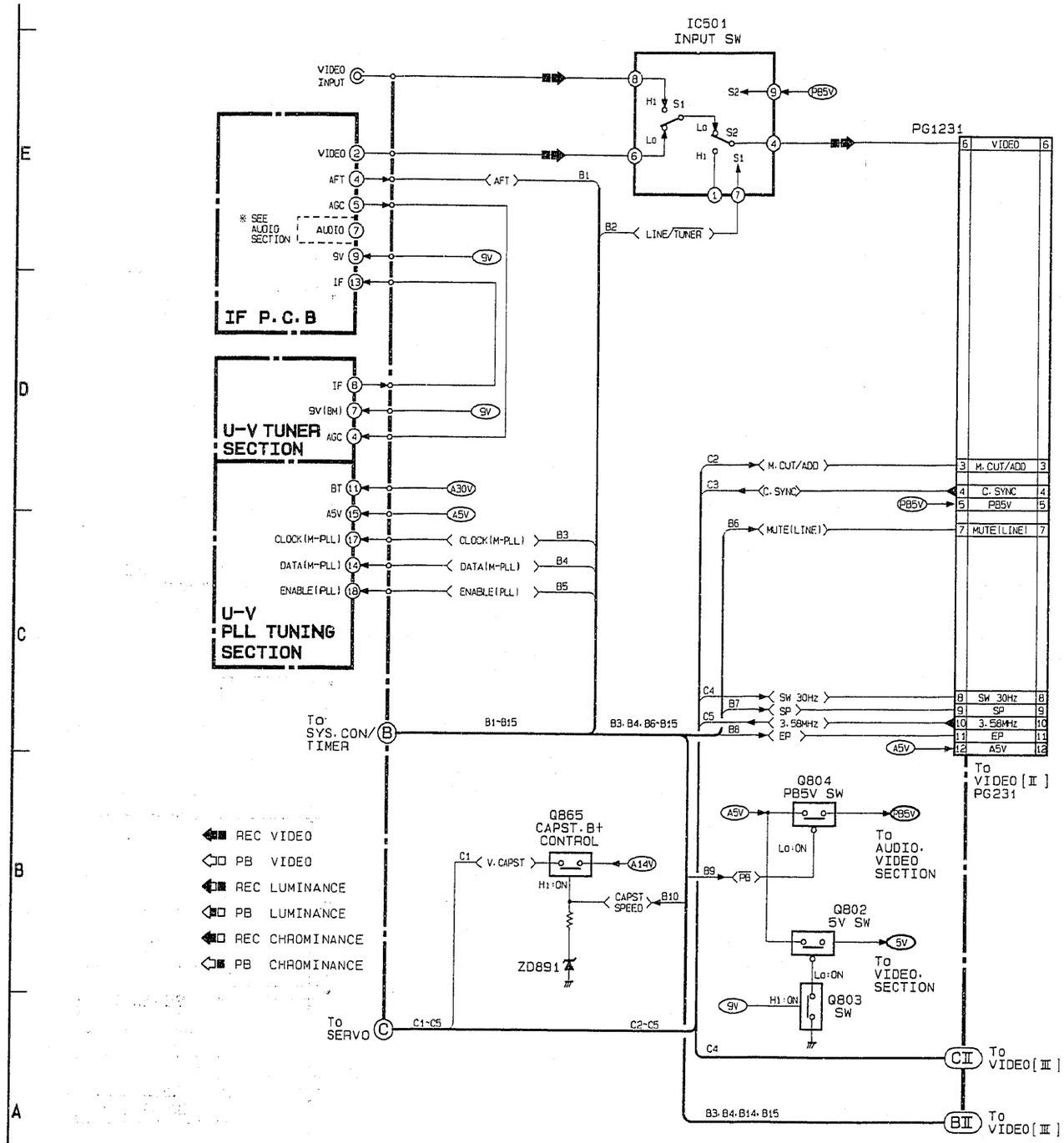


7-1 OVERALL BLOCK

2. POWER SUPPLY

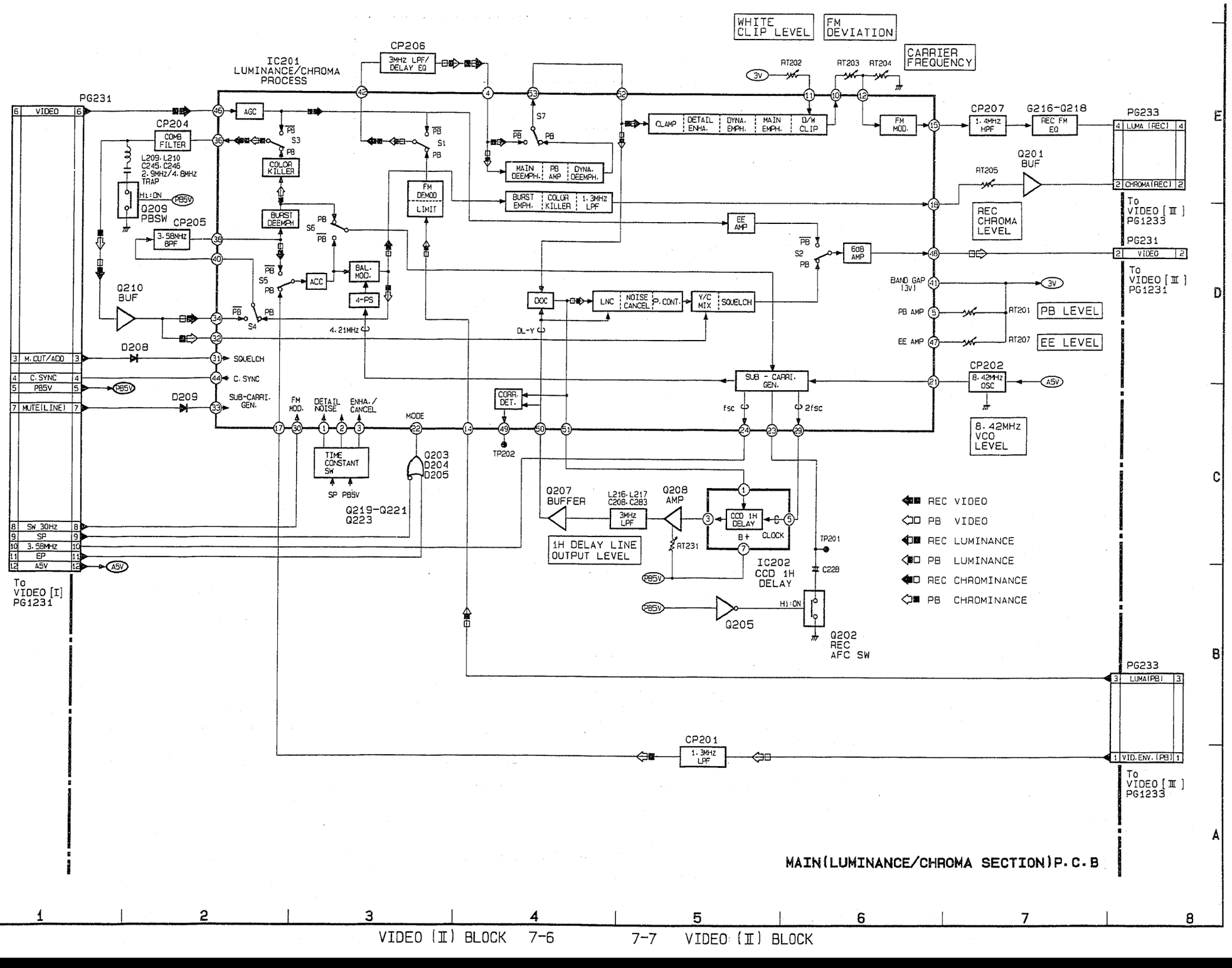


3. VIDEO (I)

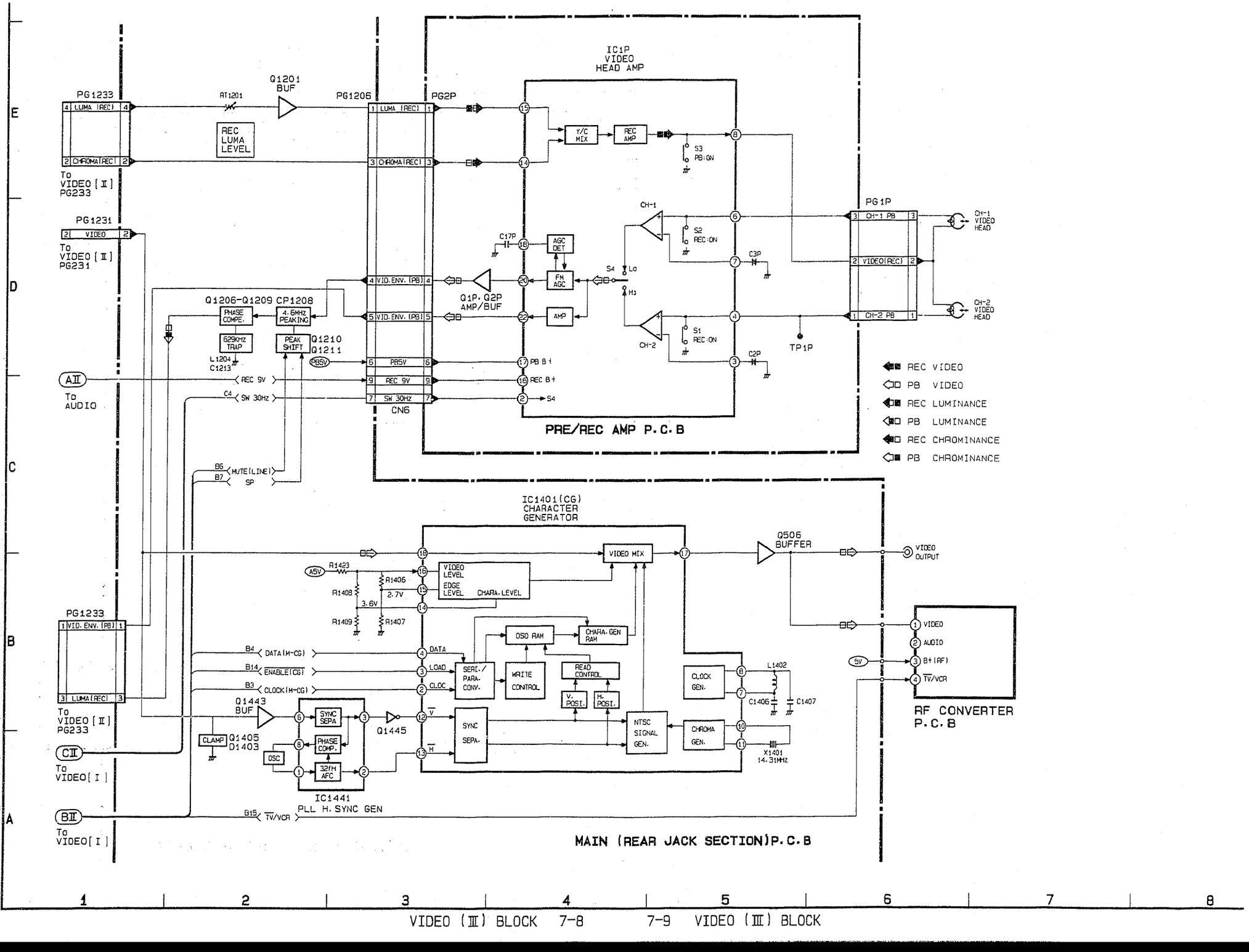


MAIN(REAR JACK SECTION)P.C.B

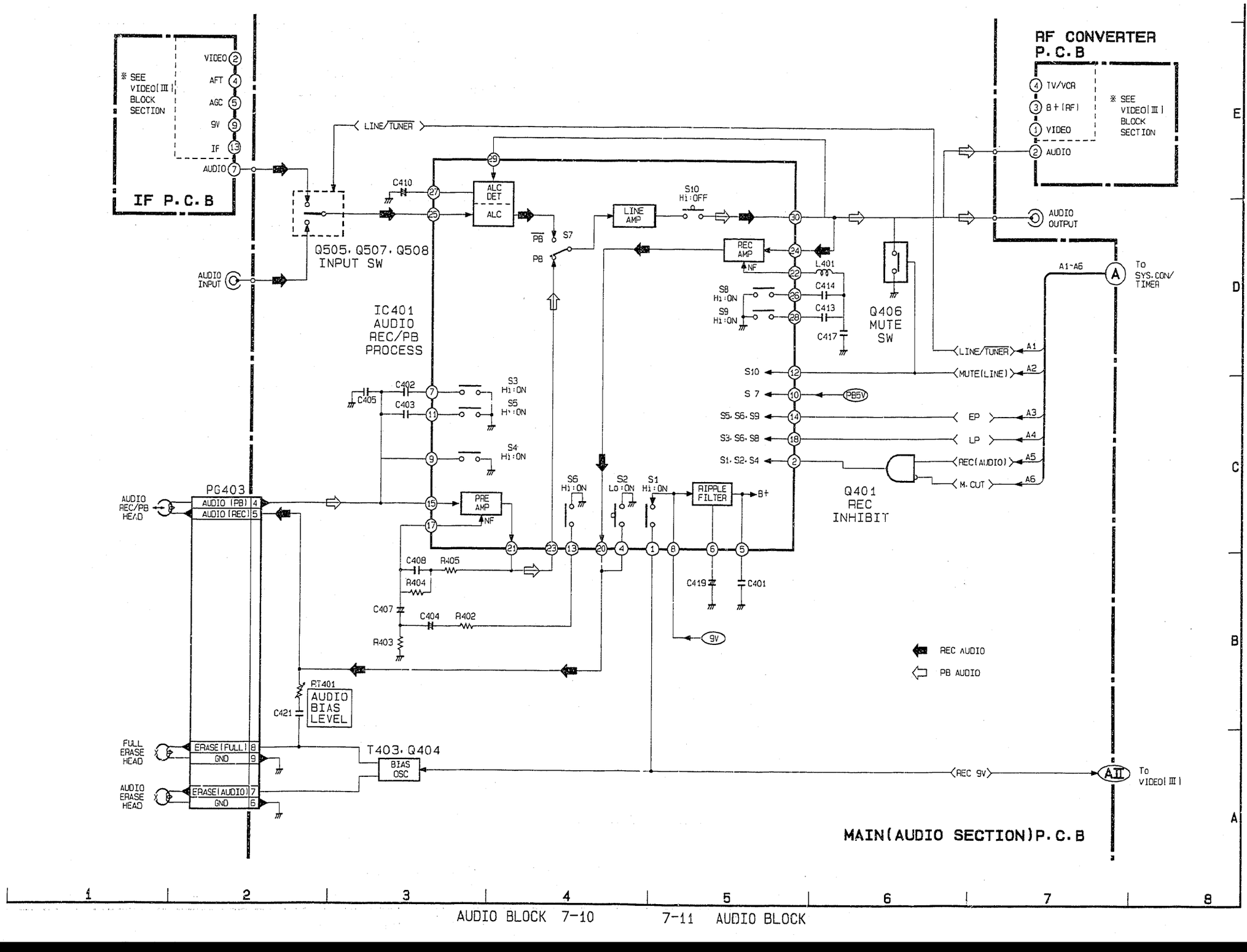
4. VIDEO (Ⅱ)


WHITE CLIP LEVEL
FM DEVIATION
CARRIER FREQUENCY
IC201 LUMINANCE/CHROMA PROCESS
CP206 3MHz LPF/ DELAY EQ
PG231
CP204 COMB FILTER
L209. L210 C245. C246 2.9MHz/4.8MHz TRAP
Hi:ON PB5V Q209 PBSW
CP205 3.58MHz BPF
Q210 BUF
D208
D209
AGC
COLOR KILLER
BURST DEEMPH
FM DEMOD LIMIT
ACC
BAL. MOD.
4-PS
4.21MHz
S1 S2 S3 S4 S5 S6 S7
CLAMP
DETAIL ENHA.
DYNA. EMPH.
MAIN EMPH.
D/W CLIP
FM MOD.
MAIN DEEMPH.
PB AMP
DYNA. DEEMPH.
BURST EMPH.
COLOR KILLER
1.3MHz LPF
EE AMP
60B AMP
DOC
LNC
NOISE CANCEL
P.CONT.
Y/C MIX
SQUELCH
DL-Y
RT202
RT203
RT204
RT205
RT201
RT207
RT231
BAND GAP (3V)
PB AMP
EE AMP
PB LEVEL
EE LEVEL
CP207 1.4MHz HPF
G216-G218 REC FM EQ
PG233
Q201 BUF
REC CHROMA LEVEL
To VIDEO [Ⅲ] PG1233
PG231
To VIDEO [Ⅲ] PG1231
CP202 8.42MHz OSC
SUB - CARRI. GEN.
fsc
2fsc
8.42MHz VCO LEVEL
CORR. DET.
TP202
FM MOD.
DETAIL NOISE
ENHA./ CANCEL
MODE
TIME CONSTANT SW
SP PB5V
Q203 D204 D205
Q219-Q221 Q223
Q207 BUFFER
L216. L217 C208. C283
3MHz LPF
Q208 AMP
CCD 1H DELAY
B+
CLOCK
1H DELAY LINE OUTPUT LEVEL
IC202 CCD 1H DELAY
TP201
C228
Q205
Hi:ON
Q202 REC AFC SW
CP201 1.3MHz LPF
PG233
LUMA(PB)
VID.ENV.(PB)
To VIDEO [Ⅲ] PG1233
REC VIDEO
PB VIDEO
REC LUMINANCE
PB LUMINANCE
REC CHROMINANCE
PB CHROMINANCE
VIDEO
M.CUT/ADD
C.SYNC
PB5V
MUTE(LINE)
SW 30Hz
SP
3.58MHz
EP
A5V
SQUELCH
C.SYNC
SUB-CARRI. GEN.
To VIDEO [I] PG1231
MAIN(LUMINANCE/CHROMA SECTION)P.C.B
1 2 3 4 5 6 7 8
A B C D E
VIDEO (Ⅱ) BLOCK 7-6
7-7 VIDEO (Ⅱ) BLOCK

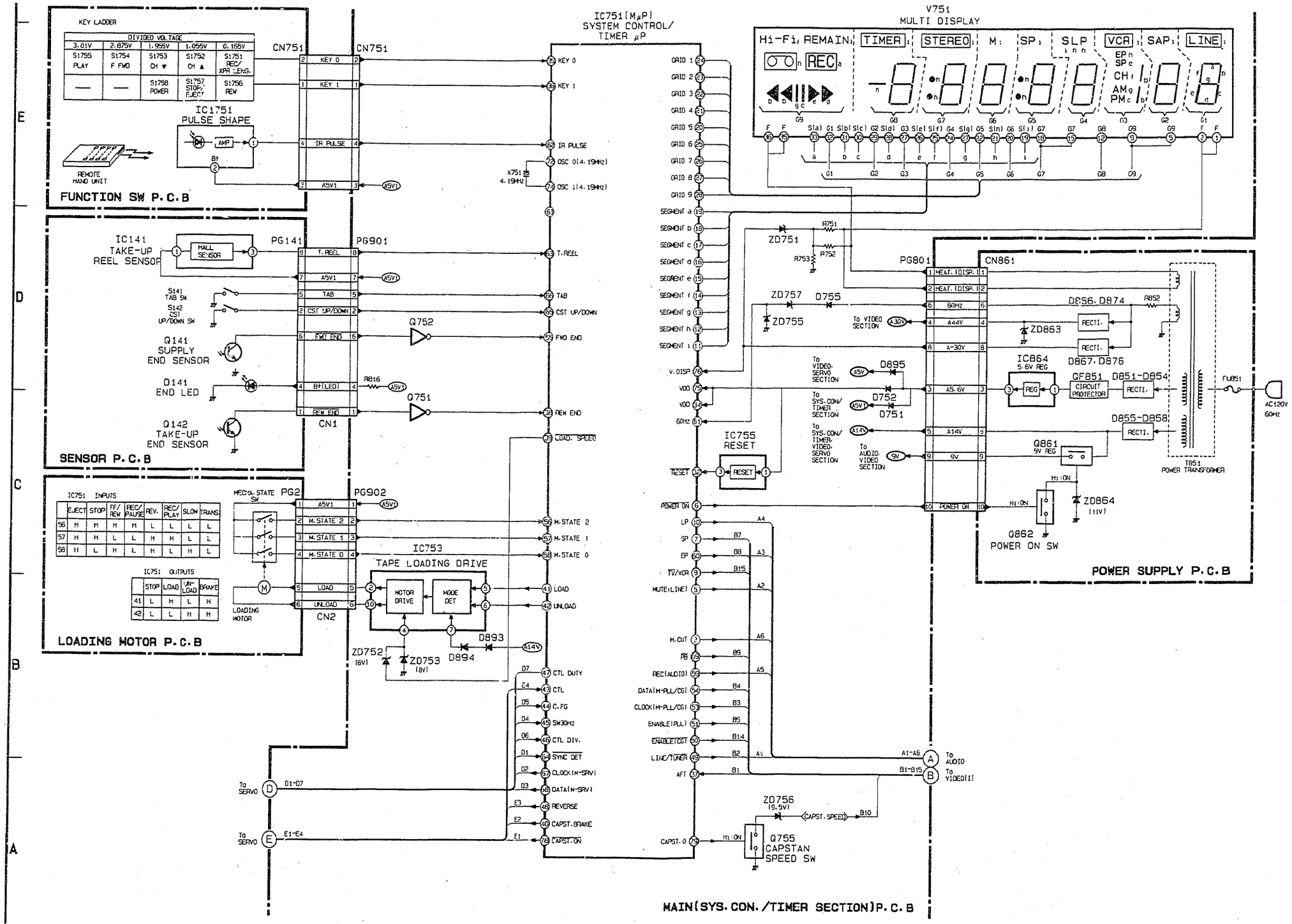
5. VIDEO (Ⅲ)


IC1P
VIDEO
HEAD AMP
PG1233
PG1206
PG2P
Q1201
BUF
AT1201
REC
LUMA
LEVEL
LUMA (REC)
CHROMA(REC)
To
VIDEO (Ⅱ)
PG233
PG1231
VIDEO
To
VIDEO (Ⅱ)
PG231
Y/C
MIX
REC
AMP
S3
PB:ON
CH-1
S2
REC:ON
C17P
AGC
DET
FM
AGC
S4
Lo
Hi
C3P
PG1P
CH-1 PB
VIDEO(REC)
CH-2 PB
CH-1
VIDEO
HEAD
CH-2
VIDEO
HEAD
Q1206-Q1209 CP1208
PHASE
COMPE.
4.6MHz
PEAKING
629KHz
TRAP
L1204
C1213
PEAK
SHIFT
Q1210
Q1211
VID. ENV. (PB)
Q1P, Q2P
AMP/BUF
AMP
S1
REC:ON
CH-2
TP1P
C2P
PB5V
PB B↑
REC 9V
REC B↑
SW 30Hz
S4
CN6
PRE/REC AMP P.C.B
REC VIDEO
PB VIDEO
REC LUMINANCE
PB LUMINANCE
REC CHROMINANCE
PB CHROMINANCE
AⅡ
To
AUDIO
C4
B6
MUTE(LINE)
B7
SP
IC1401(CG)
CHARACTER
GENERATOR
Q506
BUFFER
VIDEO MIX
A5V
R1423
R1406
2.7V
R1408
3.6V
R1409
R1407
VIDEO
LEVEL
EDGE
LEVEL
CHARA. LEVEL
VIDEO
OUTPUT
OSD RAM
CHARA. GEN
RAM
B4
DATA(M-CG)
B14
ENABLE(CG)
B3
CLOCK(M-CG)
DATA
LOAD
CLOC
SERI./
PARA-
CONV.
WRITE
CONTROL
READ
CONTROL
V.
POSI.
H.
POSI.
CLOCK
GEN.
L1402
C1406
C1407
Q1443
BUF
SYNC
SEPA
PHASE
COMP.
32fH
AFC
OSC
CLAMP
Q1405
D1403
Q1445
V
H
SYNC
SEPA.
NTSC
SIGNAL
GEN.
CHROMA
GEN.
X1401
14.31MHz
IC1441
PLL H. SYNC GEN
VIDEO
AUDIO
5V
B+(RF)
TV/VCR
RF CONVERTER
P.C.B
CⅡ
To
VIDEO(Ⅰ)
BⅡ
To
VIDEO(Ⅰ)
B15
TV/VCR
MAIN (REAR JACK SECTION)P.C.B

6. AUDIO

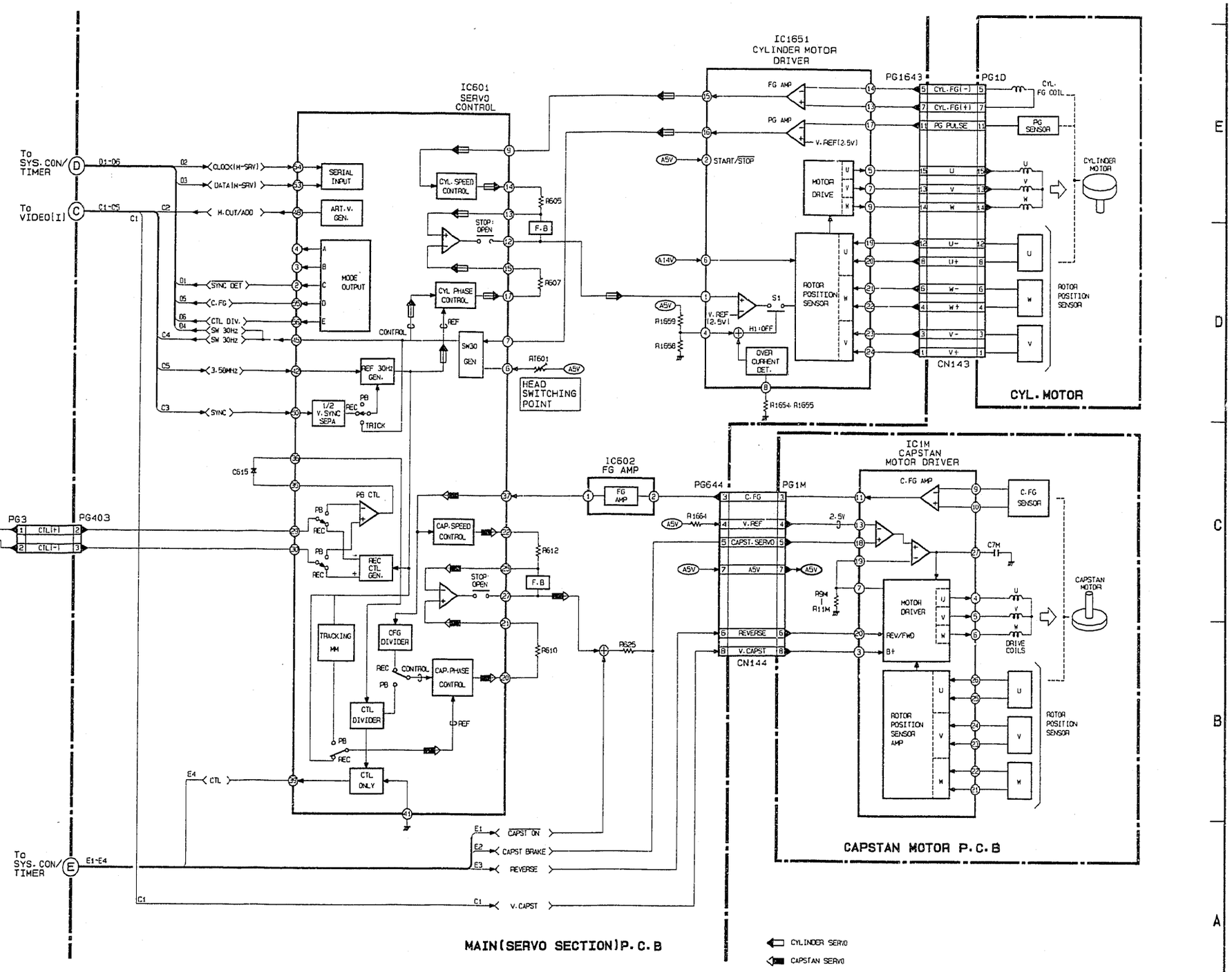

※ SEE VIDEO(III) BLOCK SECTION
VIDEO 2
AFT 4
AGC 5
9V 9
IF 13
AUDIO 7
IF P.C.B
LINE/TUNER
C410
27
25
29
ALC DET
ALC
Q505, Q507, Q508 INPUT SW
AUDIO INPUT
IC401 AUDIO REC/PB PROCESS
PB S7
PB
LINE AMP
S10 Hi:OFF
30
REC AMP
NF
24
22
L401
S8 Hi:ON
S9 Hi:ON
26
28
C414
C413
C417
Q406 MUTE SW
RF CONVERTER P.C.B
4 TV/VCR
3 B+(RF)
1 VIDEO
2 AUDIO
※ SEE VIDEO(III) BLOCK SECTION
AUDIO OUTPUT
A1-A6
A
To SYS.CON/ TIMER
LINE/TUNER A1
MUTE(LINE) A2
S10 12
S 7 10
PB5V
S5, S6, S9 14
EP A3
S3, S6, S8 18
LP A4
S1, S2, S4 2
REC(AUDIO) A5
M.CUT A6
Q401 REC INHIBIT
C402
C405
C403
7
11
9
S3 Hi:ON
S5 Hi:ON
S4 Hi:ON
PG403
AUDIO REC/PB HEAD
AUDIO (PB) 4
AUDIO (REC) 5
15
PRE AMP
NF
17
21
23
13
20
4
1
8
6
5
S6 Hi:ON
S2 Lo:ON
S1 Hi:ON
RIPPLE FILTER
B+
C419
C401
C408
R405
R404
C407
C404
R402
R403
9V
REC AUDIO
PB AUDIO
RT401
AUDIO BIAS LEVEL
C421
FULL ERASE HEAD
ERASE(FULL) 8
GND 9
AUDIO ERASE HEAD
ERASE(AUDIO) 7
GND 6
T403, Q404
BIAS OSC
REC 9V
AII
To VIDEO(III)
MAIN(AUDIO SECTION)P.C.B
E
D
C
B
A
1
2
3
4
5
6
7
8
AUDIO BLOCK 7-10
7-11 AUDIO BLOCK

7. SYS. CON/TIMER



SYS. CON/TIMER BLOCK 7-12 7-13 SYS. CON/TIMER BLOCK

8. SERVO



SERVO BLOCK 7-14 7-15 SERVO BLOCK

HITACHI

HITACHI SALES CORPORATION. TOKYO JAPAN
Head Office : THE HITACHI ATAGO BLDG. No. 15-12, 2-Chome
Nishi-Shinbashi Minato-Ku, Tokyo 105, Japan
Tel : 03-3502-2111

AMERICA

HITACHI HOME ELECTRONICS (AMERICA), INC.

Headquarters, Western Regional Office
401 West Artesia Boulevard, Compton,
California 90220 U.S.A.
Tel : 213-537-8383 Fax : 213-631-4475

Eastern Regional Office

1290 Wall Street West, Lyndhurst, New
Jersey 07071 U.S.A.
Tel : 201-935-8980 Fax : 201-935-4869

Mid-Western Regional Office

1400 Morse Ave., Elk Grove Village, Illinois.
60007 U.S.A.
Tel : 708-593-1550 Fax : 708-593-2436

Southern Regional Office

510 Plaza Drive, College Park, Georgia
30349, U.S.A
Tel : 404-763-0360 Fax : 404-763-0416

HITACHI SALES CORPORATION OF HAWAII, INC.

3219 Koapaka Street, Honolulu, Hawaii,
96819 U.S.A.
Tel : 808-836-3621 Fax : 808-833-3449

HITACHI (HSC) CANADA INC.

Montreal Office & Manufacturing Division, 3300
Trans-Canada Highway, pointe Claire, Quebec,
H9R 1B1, Canada
Tel : 514-697-9150 Fax : 514-697-2209

HITACHI SALES CORPORATION DE PANAMA, S.A

Apartado postal 7657, Panama 5, Panama City,
Rep. of panama
Tel : 63-65-00, 63-64-91 Fax : 64-8827

HITACHI SALES CENTROAMERICANA, S.A.

Apartado Postal 10272-1000
San Rafael de Escazu, San Jose, Costa Rica
Tel : 28-20-11 Fax : 28-54-77

HITACHI SALES CORPORATION DE EL SALVADOR, S.A.

Apartado Postal N° 818 San Salvadore,
El Salvador 11a, Calle Oriente, N° 130
Tel : 21-29-22, 22-60-14 Fax : 22-8372

COMPANIA ELECTRONICA COLOMBIANA, S.A

Apatado Postal 14933
Calle 5a, N° 19-A-31, Bogota D.E.
Tel : 47-91-16, 47-17-83 Fax : 201-8710

MAYORCA - HITACHI, C.A.

Apartado Postal 61189 Caracas-Venczuela 3ra.
Transversal, entre 1ra. Av. y Av.
Andros Bello Centro Comercial Cayorma.
Piso 3 Los Palos Grandes
Tel : 284-90-67, 284-03-11 Fax : 283-32-24

ELJURI HITACHI, S.A.

P.O. Box 738 Ave. Huayna Capac 8-57
Cuenca-Ecuador
Tel : 831-188, 831-385 Fax : 830-797

EUROPE

HITACHI SALES EUROPA GmbH

Rungedamm 2, 2050 Hamburg 80, Germany
Tel : 040-734110 Fax : 040-7340134

HITACHI SALES (U.K.) Ltd.

Hitachi House, Station Road, Hayes,
Middlesex UB3 4DR, England
Tel : 081-848-8787 Fax : 081-561-4565

HITACHI FRANCE (RADIO-T.V. ELECTRO-MENAGER) S.A.

95-101 Rue Charles-Michels,
93200 Saint-Denis, France
Tel : 1-48-21-6015 Fax : 1-42-43-6697

HITACHI SALES SCANDINAVIA AB

Domnarvsgatan 29 Lunda, Box 62,
S-163 91 Spanga, Sweden
Tel : 08-7955600 Fax : 08-7616250

HITACHI SALES NORWAY A/S

Postboks 68, Bruket 31, N-1620
Gressvik, Norge
Tel : 09-328255 Fax : 09-329340

SUOMEN HITACHI OY

Takojankatu 5, SF-15800 Lahti 80, Finland
Tel : 918-527800 Fax : 918-515273

HITACHI SALES A/S

Kuldyssen 13, DK-2630, Taastrup, Denmark
Tel : 42-999200 Fax : 42-999392

HITACHI SALES A.G.

Bahnhofstrasse, 19, 5600 Lenzburg,
Switzerland
Tel : 064-50 22 11 Fax : 064-51 60 56

HITACHI SALES WARENHANDELS GmbH

Kreuzgasse 27, A 1180 Wien, Austria
Tel : 0222-421678, 0222-421679
Fax : 0222-4393675

HITACHI SALES ITALIANA, S.p.A.

Via Ludovico di Breme 9, 20156 Milano, Italy
Tel : 02-30231 Fax : 2-33400021

HITACHI SALES BELGIUM S.A./ N.V.

Chaussee de Namur 56, B - 1400 Nivelles,
Belgium
Tel : 067-21-71-81, 067-21-79-81
Fax : 67-21-8078

HITACHI SALES IBERICA, S.A.

Gran Via Carlos Tercero. 101, 1-1,
Barcelona-08028 Spain
Tel : 3-330-8652 Fax : 3-339-7839

HITACHI SALES (HELLAS) S.A.

91 Falirou Street 11741 Athens, Greece
Tel : 9229300 Fax : 1-9235566

HITACHI SALES NETHERLAND B.V.

Industrieweg 17-19, 3762 EG Soest,
Postbus 465, 3760 AL Soest, Holland
Tel : 02155-16544 Fax : 02155-17324

ASIA, AFRICA, OCEANIA

HITACHI SALES (MALAYSIA) SDN. BHD.

Wisma Hitachi, No.2, Loronge 13/6A, 46200
Petaling Jaya, Selangor, Malaysia
Tel : 03-7573455 Fax : 03-7556090

HITACHI (SINGAPORE) PTE. LTD.

PSA Warehousing Services Alexandra Distripark
Block 1, # 01-03, Pasir Panjang Road
Singapore 0511
Tel : 2787177 Fax : 2734450

HITACHI SALES (THAILAND) LTD.

2240-46, New Petchburi Road, Bankapi,
Hueykuang Bangkok, Thailand
Tel : 2-314-2741 Fax : 2-319-2460

HITACHI ELECTRIC SERVICE CO., (HONG KONG) LTD.

3rd Floor Leun Tai Industrial Bldg., 72-76
Kwai Cheong Road Kwai Chung N.T.,
Hong Kong
Tel : 420-4101, 424-0126 Fax : 480-4493

Hitachi Sales Corporation of Taiwan

Room A, 11F1. No.180, Sec. 4 Chung Hsiao E.
Road, Taipei Taiwan, R. O. C.
Tel : 02-721-6686 Fax : 02-752-3211

HITACHI PRODUCTIONS MAROC ELECTRONIQUES DOMESTIQUES S.A

Rue du Havre, Casablanca, Morocco
Tel : 212-2-30-73-68, 212-2-30-73-57
Fax : 212-2-31-67-42

HITACHI CANARIAS S.A.

Calle San-Francisco No. 19, 38002 Santa Cruz
de Tenerife Canary Islands
Tel : 9-22-246498 Fax : 9-22-242310

HITACHI SALES AUSTRALIA PTY LTD.

153 Keys Road, Moorabbin, Victoria 3189
Australia
Tel : 555-8722 Fax : 3-532-1815

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